

POPULAR SCIENCE

March 1949

UN
3

25¢

Monthly



Sun Furnace in Your Attic

PAGE 106

AT LAST! OUTBOARDS THAT LET YOU

SHIFT

REVERSE • NEUTRAL • FORWARD
Just **SHIFT** the lever!



Scott-Atwater proudly presents complete new line of gear **SHIFT** motors that weigh only $1\frac{3}{4}$ lbs. more, cost only \$149.50 to \$199.50

Outboard owners have asked for it. Now Scott-Atwater has perfected it . . . a gear **SHIFT** outboard so simple, so sound, so foolproof you'll want it on sight. Easy to use . . . **SHIFT** the gear **SHIFT** to back up, stand still or go ahead (you can't clash gears). Easy to own . . . all three new **SHIFT** models priced under \$200. Easy to carry . . . the Scott-Atwater **SHIFT** adds only $1\frac{3}{4}$ pounds to motor weight. See the new **SHIFT** models at your Scott-Atwater dealer's soon. Then get ready to **SHIFT** . . . to Scott-Atwater!



FREE! NEW BOOK OF NAUTICAL KNOWLEDGE tells what every outboard skipper should know about navigation, safety and operating principles to improve your skill, and let you have more fun on the water. Write for your copy to Dept. PS-39, Scott-Atwater Mfg. Co., Minneapolis 13, Minn.

NOW ENJOY
CRUISER CONTROL
with SCOTT-ATWATER



SHIFT

... to warm up motor in neutral

SHIFT

... to back away from dock

SHIFT

... to make an "eggshell landing"

Enjoy these new features, too!

- Slip Clutch propeller protection
- Duo-Grip Carrying Handle
- Constant Pressure Water Pump

INSIDE STORY



Driveshaft gear is always engaged with both forward and reverse gears. But neither is permanently engaged with propeller shaft. When you **SHIFT**, clutch dog moves. Its position determines whether forward or reverse gear is engaged. If neither is, you're in neutral.

SHIFT

to Scott-Atwater



For further information write Dept. PS39, Scott-Atwater Mfg. Co. Inc., Minneapolis 13, Minn.

3 NEW GEAR **SHIFT** MODELS!



4 H.P.*
SINGLE
1-14 M.P.H. \$149⁵⁰



5 H.P.*
TWIN
1-16 M.P.H. \$179⁵⁰



7 1/2 H.P.*
TWIN
1-20 M.P.H. \$199⁵⁰

*to be OBC Certified

*to be OBC Certified

*OBC Cert. @ 4200 RPM

HOW TO DO WONDERS ON ACRE!

YOU don't have to pay a small fortune or buy a large farm to make your dream of a practical country home come true. *All you need is a little land!* The "Have-More" Plan shows you how to transform as little as one acre into the best and happiest living any family could want. And you can make that acre *pay for itself!*

You'll be amazed what you can do today on a little land—even in your spare time! You can have a bearing orchard with a fruit crop in just 18 months! You can raise a year's supply of tender chickens in 9 weeks—in a 3x4 foot space. You can raise a pig without buying feed. You can own a small greenhouse—one that anybody can afford—that waters plants and controls heat automatically.

And the best part of it is that you can enjoy this wonderful new way of living on less than \$100 a month. Just a small income—from your Social Security or a part-time job, or a pension—and you can live like a king for the rest of your life!

Ed and Carolyn Robinson have spent six years gathering the newest and best knowledge for you, experimenting at their own little place, "trading" methods and ideas with experts and amateurs all over the world. (Perhaps you've seen the stories about their 2-acre "miniature" farm in the *Saturday Evening Post*, *Reader's Digest*, *Better Homes and Gardens*, etc.) Now let their famous "Have More" Plan show you how to HAVE MORE in every way on YOUR place!

**Everything You'll Ever Need to Know
About Successful Country Living!**
If you have a garden, farm, or country

home, you'll certainly want a copy of this wonder book. *Reader's Digest* calls it "Good news for the millions who have or want a couple of acres in the country." Or, if you're cooped up in the city, tired of noise, dirt, and high costs, you'll want to see how easily you can afford a little land in the nearby countryside, where you and your wife and children can really begin to live. The Robinsons did. So can you! The "Have-More" Plan tells you just how—step-by-step!

**Now You Don't Need
a BIG Income
to Retire**

The "Have-More" Plan will show you just how to pick the right place, how to lay out your grounds and design your house, how to raise much of your food, how to stretch your retirement income into the best and happiest life anyone could want!

Act Now!

Don't hesitate. Make the most of that country place you now have—or expect to have. The "Have More" Plan will save you endless trouble and expense, solve a thousand problems and answer countless important questions for you. It costs only \$1—BUT FIRST WE WANT YOU TO EXAMINE IT FREE. You get complete satisfaction or DOUBLE your money back! Mail coupon NOW! **The Country Bookstore, P. O. Box 2803, Noroton, Conn.**



**Examine It
FREE!**
Only \$1.00 if you
decide to keep it

43 Chapters! 255 Illustrations! 70,000 Words! More Than 300,000 Copies Sold!

Same Plan You've Read So Much About

SATURDAY EVENING POST: "To country-minded families with growing children, to couples looking to retirement, the 'Have-More' Plan presents an exciting possibility and a way to achieve it."
READER'S DIGEST: "The 'Have-More' Plan 'a little land... a lot of living.' is the slogan of this energetic young couple who have made a suburban farm pay."
ESQUIRE: "Buy the book. Read the 'Have-More' Plan—give your future a break with this practical, sane approach to intelligent living."
BETTER HOMES AND GARDENS: "Live better on two acres... the 'Have-More' Plan gives practical details and diagrams."

ALL THIS EXPERT ADVICE AND MORE—YOURS FOR ONLY \$1.00

Houses Especially Designed
For Country Living

Score Card for
Buying Country Property

Your Own Fresh Eggs
and Chickens

Scientific Layouts for
Small Acreages

Landscaping Your Place

A Better Garden with
a Lot Less Work

Quick Freezing is Easy!

Raising Rabbits

Bees for Sugar

Berries and Grapes
Money Can't Buy!

Your Miniature Dairy

Keep Pigs On Concrete

Plans For An Ideal
Small Barn

Dwarf Fruit Trees

Geese, Turkeys, Ducks

Baby Tractors

Your Own Work Shop

Ham, Bacon, Pork—
a Few Cents a Pound

Grow Your Own Fish!

SEND NO MONEY (Unless You Prefer To)

Mail This Coupon NOW

to THE COUNTRY BOOKSTORE, P. O. Box 2803, Noroton, Conn.

Send me the "Have-More" Plan. If I keep it, I'll send one dollar, plus ten cents for postage, packing, handling. If it doesn't please me, I'll send it back, owe you nothing.

YOUR NAME.....

ADDRESS.....

CITY.....(if any)...STATE.....

If you send a dollar now, that will save us record keeping and save YOU the ten cent shipping charge. We'll give you DOUBLE your money back if you return the plan in 10 days! That's how sure we are you'll like it!

FOUNDED 1872



VOL. 154: NO. 3

POPULAR SCIENCE

MECHANICS AND HANDICRAFT

Monthly

EDITOR: Perry Githens

MANAGING EDITORS: Fred O. Newman, Volta Torrey. ART EDITOR: Howard C. Jensen.

MECHANICS & HANDICRAFT EDITOR: Harry Walton.

ASSISTANT MANAGING EDITORS: Hartley E. Howe, Frank Rowsome, Jr.

ASSOCIATE EDITORS: Howard Allaway, Alden P. Armagnac, Devon Francis, Robert Gorman, Sheldon Gallagher, Herbert Johansen, Martin Mann, Denis Sneigr, Robert P. Stevenson.

STAFF PHOTOGRAPHERS: W. W. Morris (Chief), Hubert Luckett, Orlando Guerra (Darkroom).

WESTERN EDITOR: Andrew R. Boone (Los Angeles).

ART DIRECTOR: Harry Samuels. ART ASSOCIATES: Herbert Anthony, Eric Karminski, Jr., Richard Meyer, Frances Cooper (Production).

EDITORIAL ASSISTANTS: Mae G. Dyer (Asst. to the Editor), Julia Charnif, Beatrice Eldridge, Carol Ennis, Charlotte Korch, Georgette Sparks, Ruth Westphal.

WASHINGTON CORRESPONDENT: John F. Loosbrock

PUBLISHER: Godfrey Hammond

CONTENTS FOR MARCH 1949

Cover Painting by Ray Pioch

Science News

Sun Furnace in Your Attic.....	106
March of Science.....	118
France Starts an Atomic Pile.....	125
Atoms Run New Superclock.....	143
Atom Tracers Tell How Trees Tick.....	170

Science at Work

Coal Rides Mile-Long Belt.....	117
Alcohol Made from Gasoline.....	120
Blower Breathes for Tunnel.....	120
New Bulb Glows All Over.....	125
Fruit Passes Flight Test.....	125
Meter Measures Vibrations.....	133
"Assembly Lines" for Lightning Factory	144
Married Metals Improve Pots and Planes	153

PS Features

What the Cleaner Does to Your Suit.....	121
Britain Exports Houses in Halves.....	132
Pencils Made by the Billion.....	137
Bridge Spans Changing Eras.....	140
What Is a Stink?.....	146
Reefer Fans Blow Hot or Cold.....	162
New RR Taps Rich Mine.....	166
Nylon Plays New Roles.....	167
Shotgun Does Bees' Work.....	172
How a Traffic Signal Works.....	174
Powder Rocket Unfolds Wings.....	203
Expert Cleans a Typewriter.....	214
Love, String, and Sealing Wax.....	236

Aviation

Inside Look at Jet Power.....	105
Tiny Turbine Twists Jet Starter.....	113
Rocket Launches Target Plane.....	116
Twin Jets Power "Flying Lab".....	116
More Power For Navy Jets.....	133
What's New in Aviation.....	134
How's Your Plane IQ?.....	158
Slope Lights "Funnel" Planes In.....	161
Jets Power First Fighter Flying Boat.....	164

Automobiles

Highballing the Highway Freighters.....	128
Pontiac Is TV Conscious, Too.....	142
'49 Dodge: More Room in Less Space....	152
Infrared Oven Bakes Finish.....	177
Conveyer Speeds Car Painting.....	177
Gus Gets in Under the Wire.....	178
Hints from the Model Garage.....	182
Plastic Dome Tops Hybrid Auto.....	184
Surplus Parts Make Midget Car.....	184
Car Built Entirely of Scrap.....	184
Mirror Has Fingertip Control.....	184
Little Crosley Looks Bigger.....	185
Sports-Car Fans.....	186

Inventions

New Ideas from the Inventors.....	114
New Thread Won't Ravel.....	160
Pocket Press Marks Golf Balls.....	160
New Aids for the Blind.....	171

® This mark in text indicates Trade Name.

Continued on page 4

Popular Science Monthly is published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, President and Treasurer; R. C. Wilson, Raymond J. Brown, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, re-entered as second-class matter July 26, 1948, at the Post Office in New York, N. Y., under the act of March 3, 1879; additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A. Copyright, 1949, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada, \$3.00 (2 years, \$5.50; 3 years, \$7.50); foreign countries \$1 per year extra. Subscribers must notify us of change of address four weeks in advance of the next publication date. Be sure to give both old and new addresses, including zone numbers. Vol. 154: No. 3.

ARTHUR GODFREY SAYS:

"I.C.S. made the impossible—easy!"

You've often heard Arthur Godfrey, famed "Huck Finn of Radio," now winning new renown with his coast-to-coast "Talent Scouts" and other CBS programs. But this is the first time you've heard the star on the subject of I.C.S.:

"I had to quit high school before the end of my second year. Later in life, at the U. S. Naval Materiel School at Bellevue, D. C., I had to master a working knowledge of math, all the way from simple decimals and fractions through trigonometry, in the first six weeks or be dropped from the course. So I took an I.C.S. Course and finished at the head of the class! I.C.S. made the impossible—easy!"

As usual, the former Navy radio operator and present Lt. Commander in the U. S. Naval Reserve knows what he's talking about. As an I.C.S. graduate, Mr. Godfrey is in the best of all positions to tell you about the educational system that's served so long as talent scout for American industry.

Study his statement. Then mark your interest on the coupon and mail it today for full information on what I.C.S. can do for you!



INTERNATIONAL CORRESPONDENCE SCHOOLS



BOX 7625-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Air Conditioning and Plumbing Courses

- ☐ Air Conditioning
☐ Heating
☐ Refrigeration
☐ Plumbing
☐ Steam Fitting

Chemistry Courses

- ☐ Chemical Engineering
☐ Chemistry, Analytical
☐ Chemistry, Industrial
☐ Chemistry, Mfg. Iron & Steel
☐ Petroleum Refining
☐ Pulp and Paper Making
☐ Plastics

Civil Engineering, Architectural and Mining Courses

- ☐ Architecture
☐ Architectural Drafting
☐ Bridge and Building Foreman
☐ Building Estimating
☐ Civil Engineering
☐ Coal Mining
☐ Contracting and Building
☐ Highway Engineering
☐ Lumber Dealer
☐ Reading Structural Blueprints
☐ Sanitary Engineering
☐ Structural Drafting

Structural Engineering Surveying and Mapping Communications Courses

- ☐ Electronics
☐ Practical Telephony
☐ Radio, General
☐ Radio Operating
☐ Radio Servicing
☐ Telegraph Engineering
☐ Electrical Courses
☐ Electrical Drafting
☐ Electrical Engineering
☐ Electric Light and Power
☐ Lighting Technician
☐ Practical Electrician

Internal Combustion Engines Courses

- ☐ Auto Technician
☐ Diesel-Electric
☐ Diesel Engines
☐ Gas Engines
☐ Aviation
☐ Mechanical Courses
☐ Aeronautical Engineer's, Jr.
☐ Aircraft Drafting
☐ Flight Engineer
☐ Forging
☐ Foundry Work
☐ Heat Treatment of Metals
☐ Industrial Engineering

- ☐ Industrial Metallurgy
☐ Machine Shop
☐ Mechanical Drafting
☐ Mechanical Engineering
☐ Mold-Loft Work
☐ Patternmaking—Wood, Metal
☐ Reading Shop Blueprints
☐ Sheet-Metal Drafting
☐ Sheet-Metal Worker
☐ Ship Drafting
☐ Tool Designing
☐ Welding Engineering
☐ Welding—Gas and Electric

Railroad Courses

- ☐ Air Brake
☐ Diesel Locomotive
☐ Locomotive Engineer
☐ Locomotive Fireman
☐ Locomotive Machinist
☐ Railroad Section Foreman
☐ Steam Engineering Courses
☐ Boilermaking
☐ Combustion Engineering
☐ Engine Running
☐ Marine Engineering
☐ Steam Electric
☐ Ship Fitting
☐ Toolmaking
☐ Car Inspector
☐ Steam Engr.

Textile Courses

- ☐ Cotton Manufacturing
☐ Loom Fixing
☐ Textile Designing
☐ Woolen Manufacturing
☐ Rayon Weaving

Business and Academic Courses

- ☐ Accounting
☐ Bookkeeping
☐ Business Administration
☐ Business Correspondence
☐ Certified Public Accounting
☐ Commercial
☐ Commercial Art
☐ Cost Accounting
☐ Federal Tax
☐ Foremanship
☐ Good English
☐ Higher Mathematics
☐ Motor Traffic
☐ Postal Civil Service
☐ Retailing
☐ Retail Store Management
☐ Salesmanship
☐ Sign Lettering
☐ Spanish
☐ Traffic Management
☐ Advertising
☐ First Year College
☐ French
☐ High School
☐ Secretarial
☐ Stenography

Name _____ Age _____ Home Address _____
City _____ State _____ Working Hours _____ A.M. to _____ P.M.
Present Position _____ Employed by _____

Special tuition rates to members of the Armed Forces. Enrollment under G.I. Bill and P.L. 16 approved for World War II Veterans.
Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.



FREE! NEW BOOK ON FISHING

Every Fisherman Needs It!

This new 1949 edition of "Fishing — What Tackle and When" is packed full of fishing information...the kind you want. There are hours of profitable reading in its seventy-six pages, such as:

- Bait Casting Instructions • Fly Casting Instructions • Official World-record Fish Catches • Skish Instructions • 33 New Action Fish Pictures in Color (see below)
- Fishing Hints, etc. • South Bend Tackle

You won't want to be without it. Write to-day — a postal gets it. Free!

SOUTH BEND BAIT CO., 892 High St., South Bend 23, Ind.

Lines YOU CAN TRUST

EXCEL-ORENO — The finest of fly lines. Nylon level sizes G to C, \$1.85 to \$2.80 a coil; double tapers HEH, HDH, HCH, \$9; bug tapers GAF, GBF, GCG, \$9. Also in silk at slightly higher prices.

BLACK-ORENO — World-famed bait casting line. Hard braided, smooth finish. Guaranteed. Nylon \$1.20 to \$2.25 per 50 yards. Silk slightly higher.



SOUTH BEND A NAME FAMOUS IN FISHING

New Products

World's Biggest Blowpipe.....	120
Pellets Save Seeds, Aid Growth.....	125
Slide Rule Rims Wrist Watch.....	142
Light Machine Sews and Darns.....	160
Powder Smothers Gasoline Fire.....	160
Machine Makes Big Paper Bags.....	160
380-lb. Boat Can Double as a Sled.....	176
Ratchet Fits Socket Wrenches.....	201
Cruiser Uses Outboard Motor.....	244
New Packaged Boats Offered.....	245
Grass Clipper Has Long Handle.....	248

Photography

Action Editor for Home Movies.....	224
Four Effects with One Background.....	226
Camera Takes Bug Portraits.....	228

Mechanics & Shopwork

Moldings Make the Difference.....	192
Banjo Clock of Walnut and Brass.....	198
Turned Bowls Hold Snacks.....	202
Hardwood Block Makes Ash Tray.....	204
Drawer Holds Jigsaw Blades.....	207
Kayak Built in Jig.....	211
Throw Away Your T-Square.....	218
What's Wrong?.....	241
Boat Trailer Welded of Tubing.....	246
Horse Rake Used on Tractor.....	248

Home Mechanics & Handicraft

Building a Better Doghouse.....	196
Toy Pooch Runs with Car.....	201
Cactus Grows in Lamp.....	205
Plastic Knitting Kit.....	206
Western Barbecue Tray.....	208
Shadow Box Shows China.....	210
Trick Spoon Disappears.....	210
Four Ways to Drill Glass.....	239
Wooden Blocks Protect Axe.....	246
Stainless Steel Covers Drain.....	247

Radio & Electricity

This Maze Saves 1 Minute.....	126
TV Sets Give Bigger Pictures.....	151
Rooftop Motor Turns Antenna.....	151
Mirror Becomes TV Screen.....	151
Big-Set Quality from a Midget.....	230
Tweeter Brings Out High Notes.....	233
Receiver Built on TV Show.....	235

Departments

Letters.....	16
I'd Like to See Them Make.....	98
Voice of Science.....	103
What's Your Ingenuity Quotient?.....	209
New Tools.....	221
New Shop Ideas.....	222
Photo Ideas and Equipment.....	227
News in Electronics.....	229
Keeping the Home Shipshape.....	242
To: Reader-From: Editor.....	294

THE Steky

Professional Photography
in the palm
of your hand!

16mm
CANDID CAMERA

.... the world's
finest, precision-
made miniature
camera.

HERE'S a brand
new photo-
graphic thrill. Imag-
ine... a highly accu-
rate, precision built,
imported candid cam-
era that fits right in
the palm of your
hand. Perfect for
sporting events, hunt-
ing trips, parties, etc.

Light in weight and
only $\frac{1}{2}$ the size of a pack of
cigarettes, THE STEKY is
rigidly built to the exacting
requirements of the photo-
graphic professional.

- 25 mm F3:5 color corrected STEKINAR anastigmatic lens
- Speeds; Bulb, 1/25, 1/50, 1/100
- Direct View Finder
- Takes 24 pictures, black and white or Color on economical 16 mm film
- Daylight loading
- Automatic Exposure Counter
- Fully equipped with lens cover
- Guaranteed against mechanical defects for one year.

SPECIAL

FREE GIFT OFFER!

As a special introductory offer... you will receive the following gifts FREE with each order:

- 24 exposure roll of ANSCO COLOR FILM
- Yellow optical ground filter
- Genuine leather Eveready case with strap

NEW YORK TIMES says,

"STEKY... enlargements to 5 x 7 and 8 x 10 had remarkably good definition... projected color frames very satisfactory both as to color quality and image clarity.

Still more STEKY features: Turret F 3:5 lens... removable for use in enlargers, projectors etc. FREE owners registration service. Every camera bears stamped serial number.

\$29.95

complete
TAX INCLUDED

Camera as illustrated
is $\frac{3}{4}$ actual size

PLENTY OF FILM AVAILABLE

The STEKY camera uses standard American 16mm movie film available everywhere in bulk. Loaded cartridges can be purchased from The Continental Sales Co. 24 exposure black and white loaded cartridges, \$1.50 includes fine grain developing and enlarging of each negative to $2\frac{1}{2} \times 3\frac{1}{4}$. Ansco color cartridges \$1.50 includes processing to positive transparencies. Black and white cartridges without processing 75c.

ACT NOW... Simply fill out the coupon below and mail it today. Send no money, pay postman plus C.O.D. or enclose money and we'll pay the postage.

MAIL COUPON TODAY!

CONTINENTAL SALES CO.

P.S. CI

666 Madison Avenue, New York 21, N. Y.

Please rush—STEKY 16mm Candid Camera (s)

I am ☐ enclosing \$29.95 (Continental will pay postage)

☐ Send C.O.D. I'll pay Postman plus postage

Name.....

ADDRESS.....

CITY and STATE.....

MARCH 1949 5

FREE TRAINING in **Auto Mechanics Plus good pay while learning**



Become a first-class automotive mechanic and you're set for life... sure of a good job or able to run a shop of your own. Here's your chance to learn this valuable trade and the training won't cost you a penny. In addition, you'll get good pay while learning. The United States Army is offering this outstanding opportunity to a limited number of young men who have high school diplomas, or state certificates to show equivalent education. Under the new Army plan, you can sign up for the automotive school and be sure of enrollment immediately after basic training.

In the Army trade schools you'll be taught by experts, with equipment that

is the very latest in the automotive field. These schools are the finest in the world. So good that many colleges and trade schools give credit for work done in them.

Your pay starts immediately. You'll get \$75 a month, plus free food and housing... free clothing and equipment... free medical and dental care... free retirement plan... low-cost insurance. In all, the pay is equal to \$211.50 in civilian life.

You owe it to your future to get details on this opportunity today.

You can get the facts, without obligation, at the nearest U. S. Army Recruiting station.

INTERESTED IN SOME OTHER TRADE?

Automotive Mechanics is only one of more than 60 U. S. Army trade schools open to qualified young men. Ask your Recruiting Officer about any trade in which you are interested. Chances are he can offer you what you want.

**PEACE IS AMERICA'S
MOST IMPORTANT BUSINESS**

The new peacetime Army and Air Force offer young men...

- ★ WIDEST CHOICE OF CAREER JOBS
- ★ BEST OPPORTUNITY FOR ADVANCEMENT
- ★ UNUSUAL RETIREMENT BENEFITS

U.S. ARMY and U.S. AIR FORCE
RECRUITING SERVICE



Mercury, "messenger of the gods," was slow compared with Ultrafax—which moves at the speed of light.

This messenger delivers a million words a minute

Recently, at the Library of Congress, a distinguished audience saw documents flashed across Washington by a new means of communication . . . and reproduced *in facsimile*.

This was Ultrafax in action—a super-fast television communications system developed at RCA Laboratories. Reproductions of *any* mail—personal, business, or military . . . including police descriptions, fingerprints, bank drafts—can travel at 186,000 miles a second!

Material to be sent is placed before an RCA "flying spot" scanner, and transmitted by ultra-high frequency radio signals. Miles away, the pictures appear on a picture tube and are photographed. By a new photographic process, negatives are ready for printing or projection in 40 seconds.

Eventually, when Ultrafax comes into commercial use, a complete Sunday paper, every word, every picture . . . may cross America in 60 seconds.

Science at work . . .

Ultrafax is but *one* of scores of major achievements pioneered at RCA Laboratories. This leadership in science and engineering adds *value beyond price* to any product or service of RCA and RCA Victor.

Examples of the newest developments in radio, television, and electronics may be seen in action at RCA Exhibition Hall, 36 West 49th Street, N. Y. Admission is free. Radio Corporation of America, Radio City, N. Y. 20.



RADIO CORPORATION of AMERICA

World Leader in Radio — First in Television

MARCH 1949 **7**

GET
INTO

DIESEL-AUTO MECHANICS

Master All Phases

**JOBS LIKE THESE ARE
AVAILABLE TO TRAINED
MECHANICS. CHOOSE THE
FIELD YOU LIKE BEST**

Get Complete Training

Diesel Fuel Injection
Automotive Motor Tune-up
Diesel Engine Rebuilding
General Garage Mechanic
Agricultural Implements
Auto Engine Rebuilding
Auto Elec. Service
Public Utilities
Parts Dealers
Bus & Truck Lines
Industrial Maintenance
Contracting & Excavating
Business of Your Own
AND MANY other
similar openings.

As a National Schools graduate,
you are trained for ALL opportuni-
ties in the Diesel & Auto Industries.

EARN WHILE YOU LEARN

With our practical Master Shop-
Method Home Training, you
study at home in your spare
time. You receive Spare Time
Work Lessons, which show you
how to earn while you Learn...
for extra money and experience.
You Learn by DOING.

TOOLS AND EQUIPMENT

To make your training com-
plete, we give you selected me-
chanic's tools and equipment,
illustrated below, including all-
metal tool-box—as a regular
part of your instruction.



Shop-Method Home Training by an Established Resident School Prepares you for Many Good Jobs

Opportunity is everywhere for the
trained Diesel - Auto Mechanic.
Highways throng with cars, busses,
trucks tractors. Garages and Serv-
ice Stations are kept busy. Fac-
tories, ships, farms, railroads, gen-
eral industry, are dependent upon
engine power. Here's a dynamic,
fast - growing field that needs
trained men who know ALL phases:
installation, operation, maintenance
and repair. Now—National Schools
offers you a practical, all-embrac-
ing Diesel-Auto Mechanic's Course,
including all of these advantages:

**Complete training, covering—Diesels,
High Speed and Heavy Duty; Semi-
Diesels, Gasoline and Special Fuel
Engines AND Allied Mechanics.**

Basic Lesson Texts
Diesel Installation
Operation—Maintenance
Diesel Chart Manual
Spare Time Lessons
Engine Service Manuals
Engine Repair
Drive Systems
Diesel Electric Power
Thermodynamics

TOOLS AND EQUIPMENT INVESTIGATE

Secure Full Information

**NEW, ILLUSTRATED
BOOK & SAMPLE
LESSON SHOW
HOW WE TRAIN
YOU...SEND
FOR THEM
TODAY!**

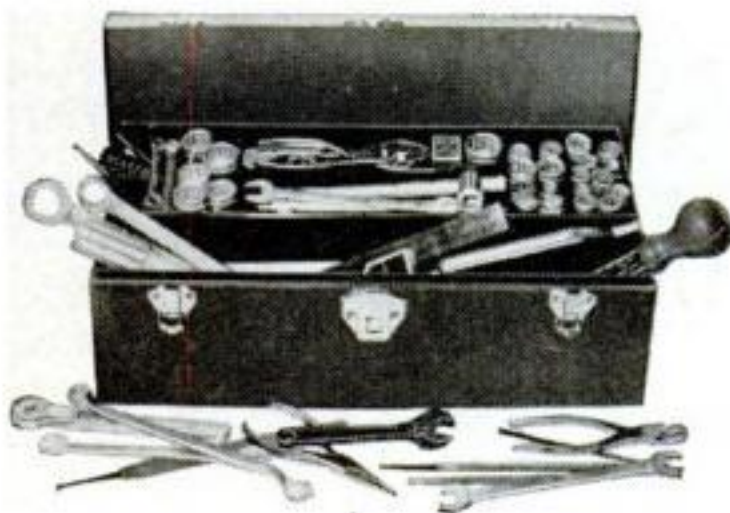
NO COST

NO OBLIGATION

**APPROVED
FOR
VETERANS**

Check coupon below

WE GIVE YOU TOOLS OF YOUR TRADE



NATIONAL SCHOOLS

LOS ANGELES 37, CALIF. • EST. 1905

FIND OUT NOW...MAIL COUPON TODAY

NATIONAL SCHOOLS, DEPT. PSD-3
4000 South Figueroa Street
Los Angeles 37, California

(Mail in envelope or
paste on penny postcard)

Mail me FREE the book, YOUR FUTURE IN DIESEL-AUTO
MECHANICS, together with the Sample Lesson. I understand
I may keep and use the information with no obligation.

Name.....Age.....

Address.....

City.....Zone...State.....

☐ Check here if Veteran of World War II



IF you're that man, here's something that will interest you.

Not a magic formula—not a get-rich-quick scheme—but something more substantial, more practical.

Of course, you need something more than just the desire to be an accountant. You've got to pay the price—be willing to study earnestly, thoroughly.

Still, wouldn't it be worth your while to sacrifice some of your leisure in favor of interesting home study—over a comparatively brief period? Always provided that the rewards were good—a salary of \$3,000 to \$10,000?

An accountant's duties are interesting, varied and of real worth to his employers. He has *standing*!

Do you feel that such things aren't for you? Well, don't be too sure. Very possibly they *can* be!

Why not, like so many before you, investigate LaSalle's modern Problem Method of training for an accountancy position?

Just suppose you were permitted to work in a large accounting house under the personal supervision of an expert accountant. Suppose, with his aid, you studied accounting principles and solved problems day by day—easy ones at first—then more difficult ones. If you could do this—and could turn to him for advice as the problems became complex—soon you'd master them all.

That's the training you follow in principle under the LaSalle Problem Method.

You cover accountancy from the basic Principles right up through Accountancy Systems and Income Tax Procedure. Then you add C. P. A. Training and prepare for the C. P. A. examinations.

As you go along, you absorb the principles of Auditing, Cost Accounting, Business Law, Statistical Control, Organization, Management and Finance.

Your progress is as speedy as you care to make it—depending on your own eagerness to learn and the time you spend in study.

Will recognition come? The only answer, as you know, is that success *does* come to the man who is really *trained*. It's possible your employers will notice your improvement in a very few weeks or months. Indeed, many LaSalle graduates have paid for their training—with increased earnings—before they have completed it! For accountants, who are trained in organization and management, are the executives of the future.

Write For This Free Book

For your own good, don't put off investigation of *all* the facts. Write for our free 48-page book, "Accountancy, The Profession That Pays." It'll prove that accountancy offers brilliant futures to those who aren't afraid of serious home study. We'll also include "Ten Years' Promotion in One"—a book which has helped many men. Send us the coupon *now*.

**LASALLE EXTENSION
CHICAGO 5, ILL.**

Over 2800 Certified
Public Accountants among
LaSalle alumni

Other LaSalle Opportunities

- ☐ Higher Accountancy
- ☐ C.P.A. Coaching
- ☐ Bookkeeping
- ☐ Law: LL.B. Degree
- ☐ Business Management
- ☐ Salesmanship
- ☐ Traffic Management
- ☐ Foremanship
- ☐ Industr'l Management
- ☐ Stenotypy
(Machine Shorthand)

LASALLE EXTENSION UNIVERSITY

A CORRESPONDENCE INSTITUTION

417 S. Dearborn St. Dept. 383-HR Chicago 5, Ill.

I want to be an accountant. Send me without obligation, "Accountancy, the Profession that Pays" training program—also "Ten Years' Promotion in One."

Name.....Age.....

Address.....

City, Zone & State.....



BUILDERS

TRADE GUIDES



4
Vols.
\$6

AUDELS CARPENTERS AND BUILDERS GUIDES—4 VOLS. \$6



Inside Information for Carpenters, Builders, Joiners, Building Mechanics—all Wood-workers. 1600 pages; 3700 diagrams; flexible; pocket size. Short-cut instructions, new methods, ideas, solutions, plans, systems—money saving suggestions. An easy progressive course for the apprentice. A practical daily helper and Quick Reference for the master worker. A Helping Hand to Easier and Better Work and Better Pay. To get this aid for yourself, simply fill in and mail the FREE COUPON below.

INSIDE TRADE INFORMATION ON:

How to use steel square; How to file and set saws; How to build furniture; How to use mitre box; How to use chalk line; How to use rules; How to make joints; Carpenters' arithmetic; Mensuration problems; Estimating

strength of timbers; How to set girders and sills; How to frame houses and roofs; How to estimate costs; How to build houses, barns, garages, bungalows, etc.; How to read and draw plans; Drawing up specifications; How

to excavate; How to use settings 12, 13 and 17 on the steel square; How to build hoists and scaffolds—skylights; How to build stairs; How to put on interior trim; How to hang doors; How to lath—lay floors; How to paint.

"Audels Guides worth four times their price—handy too as I carry them in pocket for reference." W. J. Bates, Knoxville, Pa.



4
Vols.
\$6

AUDELS PLUMBERS AND STEAMFITTERS GUIDES—4 VOLS. \$6



A new edition—just out! A practical, illustrated, Reference Library and Study-Course for Master Plumbers, Journeymen and Apprentice Steamfitters, Gas Fitters and Helpers, Sheet Metal Workers, Draughtsmen, Master Builders, Engineers and all Building Trade Students. 1670 pages; 3642 diagrams; flexible; pocket size. Guides explain all the principles, advances and short cuts of the Plumbing and Heating trade. Contains instructions on how to figure and estimate jobs. Use FREE COUPON below to examine, without obligation, this valuable work.

INSIDE TRADE INFORMATION ON:

Air Conditioning. Soldering, tinning. Joint wiping, bending, beating. Pipe—iron—steel, threading. Mathematics, tables, physics. Materials—iron, steel, copper, brass, lead, tin, antimony. Sheet metal—galvanized—plate. Sanita-

tion, syphonage, tanks. Drainage, sewage, purification. Fixtures—bath—kitchen. Pipe fittings, soil pipe, tools. Laying out work. Roughing. Screwed fittings, flanges, joints. Pipe bending, examples. Elbows. Heating, ven-

tilation, refrigeration. Water supply, mains, wells, tanks. Gas-fittings. Underwriters. Sheet metal work, problems, methods, Brazing, heating, lead burning. Welding, various welds, methods. Blacksmithing, forges, tools.

"Audels Guides are practical, easy to understand, reliable. Cover the field in plain language." W. F. Arminger, Annapolis, Md.



4
Vols.
\$6

AUDELS MASONS AND BUILDERS GUIDES—4 VOLS. \$6



A complete, illustrated trade reference library, for Bricklayers, Cement Workers, Plasterers, Tile Setters and Stone Masons, including a practical outline of Steel Construction. 1100 pages; 2067 diagrams; flexible; pocket size. A practical Trade Assistant explaining modern methods of masonry construction. Easy to understand and apply. A reliable and authentic reference work and study-course for Master Journeyman and Young Mechanic. Use FREE COUPON below and find out for yourself, without obligation, whether this set will benefit you.

INSIDE TRADE INFORMATION ON:

Bricklaying, tools, materials; Brick designs, patterns, bonds; Setting frames and foundations; Mortars, scaffolds, estimating; Mortars and mortar mixing; Tile setting, mosaic, hollow tile; Straight edge test, trow-

eling; How to figure brick work; Safe loads, piers, chimneys; Boiler settings, anchors, fire stops; Labor tables; Concrete, forms; How to figure concrete work; Stucco—on old and new buildings; Plastering—wood lath—metal;

Plasterers agreement; Plastering on various surfaces; Stone masonry; Cutting, finishing, estimating stone; Derricks, rigging; Steel construction; Fire proof; How to read blue prints.

"Audels Masons Guides are the best books on the subject. Have laid brick 12 years and am able to judge." N. A. Sonnett, Corliss, Pa.



PRACTICAL ELECTRICITY—1 VOL. \$4



Audels Handy Book of Practical Electricity is a simplified Ready Reference and Study Course in one pocket size volume—for Engineers, Professional Electricians and Students. 1040 pages; 2600 diagrams; flexible bound. A reliable authority and handy helper for every electrical worker. Contains important and valuable wiring diagrams, calculations, machine sketches, helps on maintenance and repair. Use this FREE COUPON today and find out, without obligation, how this handy book will help you in your daily work.

Complete in one handy, red leather bound volume



INSIDE TRADE INFORMATION ON:

Electro-Therapeutics, X-Rays, Shocks, Welding, Brazing, Radio Hook-ups, Motion Pictures, Telephone, Telegraph, Cranes, Bells, Elevators, Pumps, Tools, Ship Drive, Railways, Vehicles, Automobile Electric Systems, Ignition, Generation, Lighting, Plant Management, Power

Plans, Armature Winding, Repairing, A. C. Motors and Apparatus, D. C. Motors and Apparatus, Alternator Construction, Dynamos, Wiring, Diagrams, Sign Flashers, Cable Splicing, Power Wiring, Outside Wiring, Switches, Lighting, Rectifiers, Converters, Transformers, Fuses, Circuit Breakers, Rheostats, Electro Plating, Electrolysis, Storage Batteries, Magnetism, Electrical Energy, Conductors, Insulators, Static, Dynamic, Radio Electricity, Applications, Ready Reference and Index Covering the entire field of Modern Electricity.

Learn More and You Will Earn More!

Know your job and you'll never be without one. The skilled man is always in demand. Knowledge is power. Learn your trade thoroughly by easy reading. This coupon is your opportunity for advancement and better pay. You risk nothing in sending for Audels Guides for free examination. Send it NOW!

FREE
EXAMINATION
COUPON

THEO. AUDEL & CO.
49 W. 23 ST., NEW YORK CITY

Please mail me for free examination the books marked (x) below. If I find them satisfactory, I agree to mail \$1 in 7 days, on each set ordered, and to further mail \$1 monthly on each set until I have paid the purchase price.

☐ 4 CARPENTERS GUIDES \$6 ☐ 4 PLUMBERS GUIDES \$6
☐ 4 MASONS GUIDES \$6 ☐ 1 ELECTRICIANS HANDY BOOK \$4

NAME.....

ADDRESS.....

OCCUPATION.....

EMPLOYED BY.....BUCK '49

AUDELS CARPENTERS & BUILDERS GUIDES—(4 Book Set).....\$6

A practical illustrated trade assistant on modern construction for carpenters, joiners, builders, mechanics and all woodworkers. 4 vols., 1600 pages, 3700 illustrations. Fully indexed, flexible covers. Each volume sold separately \$1.50 a vol.

AUDELS PLUMBERS & STEAMFITTERS GUIDES—(4 Book Set).....\$6

A Practical Trade Assistant & Ready Reference. Explains in plain language & by clear illustrations, diagrams, charts, graphs, pictures principles of modern plumbing practice including Marine Pipe Fitting and Air Conditioning. 4 Vols.—1670 Pages—3642 Diagrams & Illustrations. Each Vol. Sold Separately \$1.50 a Vol.

AUDELS OIL BURNER GUIDE.....\$1

384 Pages Covering Installation, Servicing & Repairs All Types Domestic & Industrial Burners. Illustrated. Highly Endorsed.

AUDELS HOUSE HEATING GUIDE.....\$4

1000 Pages Covering Working Principles, Installation, Service of All Modern House Heating, Ventilating & Air Conditioning Systems. Explains New Radiant Heating. Fully Illustrated & Indexed.

AUDELS REFRIGERATION & AIR CONDITIONING GUIDE.....\$4

New from Cover to Cover—1280 Pages, Fully Illus. Covering basic principles, servicing, operation & repair of household, commercial & industrial refrigeration & air conditioning. A gold mine of essential important facts for engineers, servicemen, users.

AUDELS SHEETMETAL WORKERS HANDY BOOK.....\$1

Practical inside information. Fundamentals of Sheet Metal Work. 388 pages. Illustrated. 11 sections. Clearly written. Essential & important facts, figures, pointers in everyday language. Ref. Index.

AUDELS SHEETMETAL PATTERN LAYOUTS.....\$4

Developed by Experts for Sheet Metal Workers, Layout Men & Mechanics. A Practical Encyclopedia in 10 Sections, size 7 x 10 x 2—1125 Pages—350 Layouts—1600 Illustrations. 1001 Key Facts. Fully indexed for ready reference in answering your layout problems. Covers all phases of sheet metal work including Pattern Cutting, Pattern Development & Shop Procedure.

AUDELS BLUE PRINT READING.....\$2

For Mechanics & Builders. Covers all types of blue print reading including ship & airplane. 416 pages, fully illustrated.

AUDELS MATHEMATICS & CALCULATIONS FOR MECHANICS \$2

Mathematics for home study or reference. 700 pages, 550 illus. Practical mathematics from beginning. How to figure correctly. Easy, correct methods covering complete review. Illus. & Indexed.

AUDELS AUTOMOBILE GUIDE.....\$4

A practical quick ready reference book for auto mechanics, service men, operators & owners. Explains theory, construction & servicing of modern motor cars, trucks, buses & auto type Diesel engines. 1700 pages, fully illustrated. 55 chapters. Indexed. A standard book for mechanics. New Hydraulic drive covered.

AUDELS DIESEL ENGINE MANUAL.....\$2

A practical, concise treatise with questions and answers on the theory, operation and maintenance of modern diesel engines. Over 400 pages, fully illus. All details plainly brought out, this book is of extreme value to engineers, operators & students.

AUDELS WELDERS GUIDE.....\$1

A concise, practical text on operation & maintenance of all welding machines for all mechanics. Over 400 pages, illustrated. Covers all methods of electric and acetylene welding including airplane work.

AUDELS MACHINIST & TOOLMAKERS HANDY BOOK.....\$4

Covers modern machine shop practice in all its branches. Tells how to set up & operate lathes, screw and milling machines, shapers, drill presses & all other machine & hand tools. 1600 pages, fully illustrated. Indexed. 5 sections. 1—Modern Machine Shop Practice. 2—Blue Print Reading & How to Draw. 3—Calculations & Mathematics for Machinists. 4—Shop Physics. 5—How to Use the Slide Rule. 60 chapters. Easy to read and understand. A shop companion that answers your questions.

AUDELS ELECTRIC MOTOR GUIDE \$4

Practical Information Covering Construction, Control, Maintenance & Wiring Hookups of All Types Electric Motors also Armature Winding. 1000 Pages Fully Illustrated & Indexed.

AUDELS ELEC. WIRING DIAGRAMS \$1

210 Pages. Illustrated. Gives practical facts on wiring of electrical apparatus. It shows clearly how to wire apparatus for practically all fields of electricity. Each diagram is complete & self-explanatory. Highly Endorsed Pocket Companion.

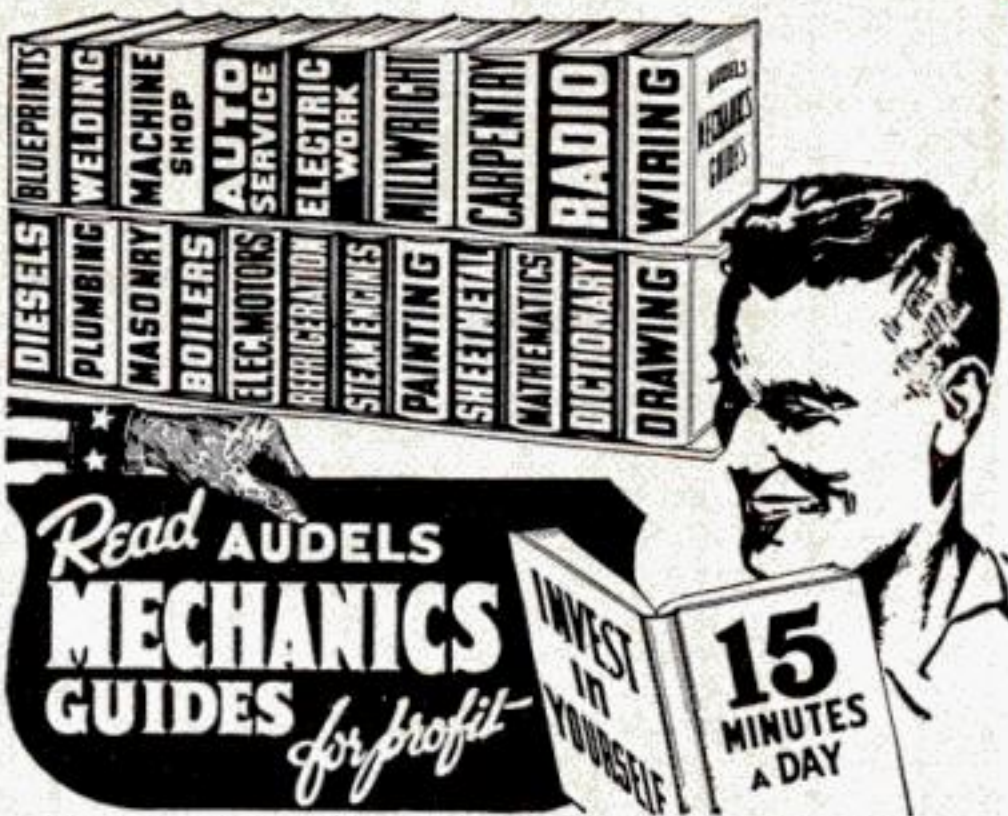
AUDELS PRACTICAL ELECTRICITY \$4

A key to a practical understanding of Electricity. For maintenance engineers, electricians & all electrical workers. 1440 Pages. 2600 Illus. Covers important electrical information in handy form—including wiring for Light & Power. Indexed.

AUDELS RADIOMANS GUIDE.....\$4

A key to the practical understanding of radio including Frequency Modulation, Television, etc., Aircraft & Marine Radio. For radio engineers, servicemen, amateurs, 914 Pages, 633 Illustrations & Diagrams. Photos. Review Questions & Answers. Reference Index.

AUDEL, Publishers, 49 W. 23 St., N.Y. 10



AN AUDEL GUIDE IS A GOOD FRIEND!

Step Up Your Own Skill with the Practical Facts and Figures of Your Trade. Save time and money with right methods, short cuts, labor saving ideas. CHECK NOW! You can look over any Audel Guide in your home. Start the Easy Payments if satisfied.

— — — CUT HERE — — — MAIL ORDER

AUDEL, Publishers, 49 W. 23 St., New York 10, N. Y.

Please mail me for 7 days' free examination the books marked (X) below. I agree to mail \$1 in 7 days on each book or set ordered, and to further mail \$1 a month on each book or set ordered until I have paid the purchase price.

If I am not satisfied with Guides I will return them.

- | | |
|---|------|
| <input type="checkbox"/> AUTOMOBILE GUIDE, 1700 Pages | \$ 4 |
| <input type="checkbox"/> DIESEL ENGINE MANUAL, 400 Pages | 2 |
| <input type="checkbox"/> WELDERS GUIDE, 400 Pages | 1 |
| <input type="checkbox"/> CARPENTERS & Builders Guides (4 Book Set) | 6 |
| <input type="checkbox"/> PLUMBERS & Steamfitters Guides (4 Book Set) | 6 |
| <input type="checkbox"/> MASONS and Builders Guides (4 Book Set) | 6 |
| <input type="checkbox"/> BLUE PRINT READING, 416 Pages | 2 |
| <input type="checkbox"/> MASTER PAINTER & Decorator, 320 Pages | 2 |
| <input type="checkbox"/> GARDENERS & GROWERS GUIDES (4 Book Set) | 6 |
| <input type="checkbox"/> OIL BURNER GUIDE, 384 Pages | 1 |
| <input type="checkbox"/> HOUSE HEATING GUIDE, 1000 Pages | 4 |
| <input type="checkbox"/> REFRIGERATION & Air Conditioning Guide, 1280 Pages | 4 |
| <input type="checkbox"/> SHEET METAL WORKERS Handy Book, 388 Pages | 1 |
| <input type="checkbox"/> SHEET METAL PATTERN LAYOUTS, 1100 Pages | 4 |
| <input type="checkbox"/> AIRCRAFT WORKER, 240 Pages | 1 |
| <input type="checkbox"/> MECHANICAL DRAWING GUIDE, 160 Pages | 1 |
| <input type="checkbox"/> MECHANICAL DRAWING & DESIGN, 480 Pages | 2 |
| <input type="checkbox"/> MATHEMATICS and CALCULATIONS, 700 Pages | 2 |
| <input type="checkbox"/> MECHANICAL DICTIONARY, 968 Pages | 4 |
| <input type="checkbox"/> MACHINISTS & Toolmakers Handy Book, 1600 Pages | 4 |
| <input type="checkbox"/> MILLWRIGHTS & Mechanics Guide, 1200 Pages | 4 |
| <input type="checkbox"/> POWER PLANT ENGINEERS GUIDE, 1500 Pages | 4 |
| <input type="checkbox"/> ENGINEERS & FIREMANS EXAMINATIONS, 528 Pages | 1 |
| <input type="checkbox"/> PUMPS, HYDRAULICS & Air Compressors, 1658 Pages | 4 |
| <input type="checkbox"/> MARINE ENGINEERS Handy Book, 1280 Pages | 4 |
| <input type="checkbox"/> ENGINEERS and Mechanics Guides (8 Book Set) | 12 |
| <input type="checkbox"/> Answers on Practical ENGINEERING, 254 Pages | 1 |
| <input type="checkbox"/> ELECTRIC WIRING DIAGRAMS, 210 Pages | 1 |
| <input type="checkbox"/> ELECTRICIANS EXAMINATIONS, 250 Pages | 1 |
| <input type="checkbox"/> ELECTRIC DICTIONARY, 9000 Terms | 2 |
| <input type="checkbox"/> ELECTRIC MOTOR GUIDE, 1000 Pages | 4 |
| <input type="checkbox"/> PRACTICAL ELECTRICITY Handy Book, 1440 Pages | 4 |
| <input type="checkbox"/> ELECTRICAL POWER CALCULATIONS, 425 Pages | 2 |
| <input type="checkbox"/> RADIOMANS GUIDE, 914 Pages | 4 |
| <input type="checkbox"/> ELECTRONIC DEVICES, 216 Pages | 2 |
| <input type="checkbox"/> NEW ELECTRIC LIBRARY, 7000 Pages (12 Book Set) | 18 |

Vols. I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII—\$1.50 Each

Name.....

Address.....

Occupation.....

Employed by.....

PSM



ARE the tales of strange human powers false? Can the mysterious feats performed by the mystics of the Orient be explained away as only illusions? Is there an intangible bond with the universe beyond which draws mankind on? Does a mighty Cosmic intelligence from the reaches of space ebb and flow through the deep recesses of the mind, forming a river of wisdom which can carry men and women to the heights of personal achievement?

Have You Had These Experiences?

... that unmistakable feeling that you have taken the wrong course of action, that you have violated some inner, unexpressed, better judgment. The sudden realization that the silent whisperings of self are cautioning you to keep your own counsel—not to speak words on the tip of your tongue in the presence of another. That something which pushes you forward when you hesitate, or restrains you when you are apt to make a wrong move.

These urges are the subtle influence which when understood and directed has made thousands of men and women masters of their lives. There IS a source of intelligence within you as natural as your senses of sight and hearing, and

more dependable, which you are NOT using now! Challenge this statement! Dare the Rosicrucians to reveal the functions of this Cosmic mind and its great possibilities to you.

Let This Free Book Explain

Take this infinite power into your partnership. You can use it in a rational and practical way without interference with your religious beliefs or personal affairs. The Rosicrucians, a world-wide philosophical movement, invite you to use the coupon below, now, today, and obtain a free copy of the fascinating book, "The Mastery of Life," which explains further.

USE THIS COUPON

Scribe L. R. E.

The Rosicrucians, AMORC, San Jose, California.

I am sincerely interested in knowing more about this unseen, vital power which can be used in acquiring the fullness and happiness of life. Please send me, without cost, the book, "The Mastery of Life," which tells how to receive this information.

Name.....

Address.....

The ROSICRUCIANS (AMORC)

(The Rosicrucians are NOT a religious organization.)

are you suffering from *HIDDEN TALENTS?*



Locked in your mind may be the germ of a valuable idea . . . an undeveloped aptitude . . . a hidden talent. And the key that can help unlock those capabilities of yours is *training*—sound, practical, down-to-earth training!

Helping men and women bring out the best that's in them has been the job of I.C.S. for more than 57 years. In every field of industry, you'll find leaders whose skills were developed through study with I.C.S.

They are the ones who sensed a latent ability within themselves—and *who proceeded to do something about it*. While others (equally gifted, perhaps) plodded along in routine jobs, they mastered I.C.S. courses . . . qualified themselves for rich rewards.

You can develop your hidden talents the same way they did. Start *today* and be ready for tomorrow's opportunities. Here's the coupon to mail:

INTERNATIONAL CORRESPONDENCE SCHOOLS



BOX 7626-M SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Business and Academic Courses

- ☐ Accounting
- ☐ Bookkeeping
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Certified Public Accounting
- ☐ Commercial
- ☐ Commercial Art
- ☐ Cost Accounting
- ☐ Federal Tax
- ☐ First Year College
- ☐ Foremanship
- ☐ Good English
- ☐ Higher Mathematics
- ☐ Motor Traffic
- ☐ Retailing
- ☐ Salesmanship
- ☐ Sign Lettering
- ☐ Spanish
- ☐ Traffic Management
- ☐ Air Conditioning and Plumbing Courses
- ☐ Air Conditioning
- ☐ Heating
- ☐ Refrigeration
- ☐ Advertising
- ☐ French
- ☐ High School
- ☐ Postal Civil Service
- ☐ Retail Store Management
- ☐ Secretarial
- ☐ Stenography
- ☐ Plumbing
- ☐ Steam Fitting

Chemistry Courses

- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Chemistry, Mfg. Iron & Steel
- ☐ Petroleum Refining
- ☐ Plastics
- ☐ Pulp and Paper Making

Civil Engineering, Architectural and Mining Courses

- ☐ Architecture
- ☐ Architectural Drafting
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Coal Mining
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Lumber Dealer
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping

Communications Courses

- ☐ Electronics
- ☐ Practical Telephony
- ☐ Radio, General
- ☐ Radio Operating
- ☐ Radio Servicing

Telegraph Engineering

- ☐ Electrical Courses
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician
- ☐ Power House Electric
- ☐ Ship Electrician

Internal Combustion Engines Courses

- ☐ Auto Technician
- ☐ Diesel-Electric
- ☐ Diesel Engines
- ☐ Aviation
- ☐ Gas Engines

Mechanical Courses

- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting
- ☐ Flight Engineer
- ☐ Forging
- ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Metallurgy
- ☐ Machine Shop
- ☐ Machine Shop Inspection
- ☐ Mechanical Drafting
- ☐ Mechanical Engineering

- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting
- ☐ Ship Fitting
- ☐ Tool Designing
- ☐ Toolmaking
- ☐ Welding—Gas and Electric
- ☐ Welding Engineering

Railroad Courses

- ☐ Air Brake
- ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Locomotive Machinist
- ☐ Railroad Section Foreman

Steam Engineering Courses

- ☐ Boilermaking
- ☐ Combustion Engineering
- ☐ Engine Running
- ☐ Marine Engineering
- ☐ Steam Electric
- ☐ Steam Engineer
- ☐ Textile Courses
- ☐ Cotton Manufacturing
- ☐ Loom Fixing
- ☐ Rayon Weaving
- ☐ Textile Designing
- ☐ Woolen Manufacturing

Name _____ Age _____ Home Address _____

City _____ State _____ Working Hours _____ A.M. to _____ P.M.

Present Position _____ Employed by _____

Special tuition rates to members of the Armed Forces. Enrollment under G.I. Bill and P.L. 16 approved for World War II Veterans.
Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

HOW TO MAKE MONEY
in RADIO
ELECTRONICS
TELEVISION

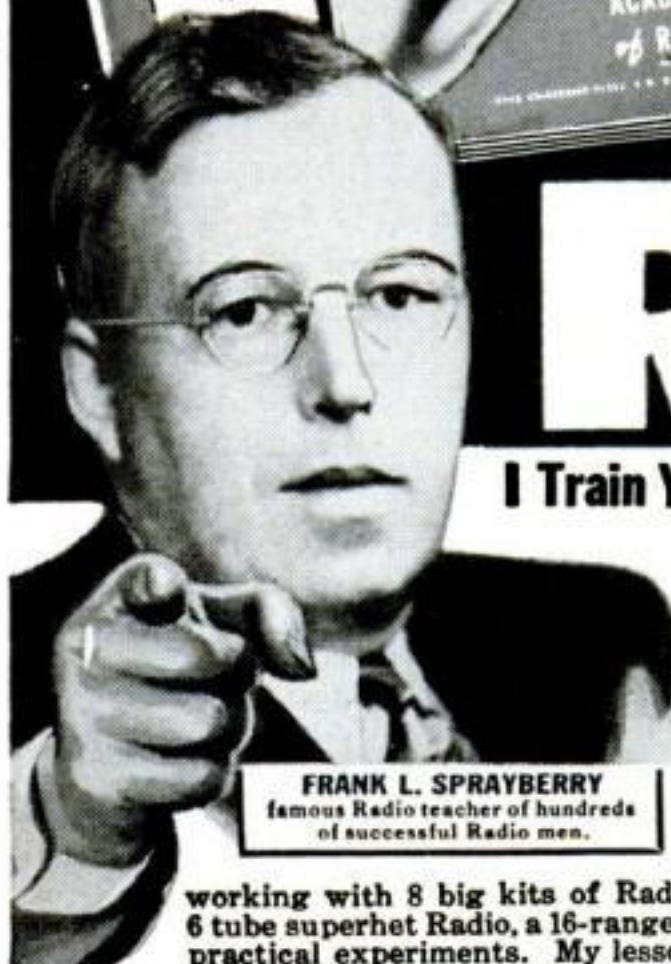
HOW TO READ
RADIO DIAGRAMS
AND SYMBOLS

SPRAYBERRY
P. O. BOX 54

SPRAYBERRY
ACADEMY
of RADIO

GET THESE 2 BIG BOOKS
FREE..

IF YOU
WANT TO LEARN
RADIO!



FRANK L. SPRAYBERRY
famous Radio teacher of hundreds
of successful Radio men.

**I Train You RIGHT by Sending You 8 BIG KITS of Radio Equipment
including A POWERFUL 6 TUBE SUPERHET
RECEIVER and 16 RANGE TEST METER!**

Find out NOW how Sprayberry Training prepares you for a Radio Service Business of your own — or a good pay Radio job. Just mail the coupon for a FREE Sample Lesson and my big FREE book, "How To Make Money In Radio, Electronics, Television." I train you at home during spare hours by putting you to work building, testing, repairing,

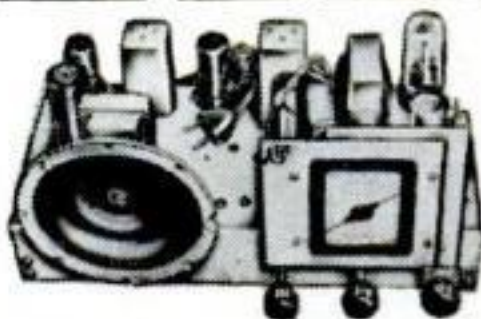
no previous experience in Radio. My famous *Business Builders* help you earn EXTRA CASH getting and doing neighborhood Radio Service jobs while learning. You couldn't pick a better time to get into Radio. Good Radio Service and Repair Shops are needed everywhere as millions of new sets are in use. Trained men are wanted for opportunities in Police, Aviation and Marine Radio, F.M., Standard Broadcasting and Television. Mail coupon today for my FREE Books.

working with 8 big kits of Radio parts I supply. You build a powerful 6 tube superhet Radio, a 16-range test meter, perform over 175 interesting, practical experiments. My lessons are easy and interesting. . . you need

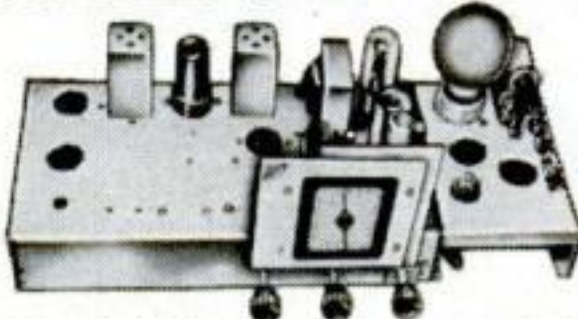
LEARN HOW TO BUILD-TEST-REPAIR RADIOS By Working with YOUR HANDS!



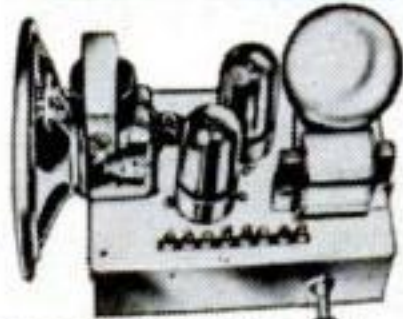
I give you a fine, moving coil type Meter—with parts for a complete analyzer and Circuit Continuity Tester. "Trouble-shoot" with professional accuracy.



You really learn Radio the PRACTICAL way . . . when you build this big, powerful 6-tube Superhet Radio from parts I send you.



You don't have to buy expensive ready-made equipment. You get valuable experience building this Signal Generator and Multi-purpose Tester.



You construct this rectifier, filter, resistor and condenser tester, and really get on the Practical end of Radio.

LOW COST RADIO TRAINING STUDY AT HOME IN SPARE HOURS

RUSH COUPON Today!

SPRAYBERRY ACADEMY OF RADIO, Dept. 55-P
Sprayberry Building, Pueblo, Colorado, or
20 N. Wacker Drive, Chicago 6, Illinois

Please rush my FREE copies of "How to Make Money In Radio, Electronics and Television" and "How to Read Radio Diagrams and Symbols." No Salesman will call.

Name _____ Age _____

Address _____

City and Zone _____ State _____

☐ CHECK HERE IF A VETERAN

(Mail in an Envelope or Paste on Penny Postcard)

Easy monthly payments, if desired. Everything you need is furnished—nothing else to buy. The equipment I send you is yours "for keeps"—to use in your business or job. I have trained hundreds of successful Radio men — and I can help you, too. Get the facts about Sprayberry Training—it's your first step to success, security and a bigger income. Fill out and mail coupon today. I'll rush my 2 Free books to you by return mail.

VETERANS: Approved for G. I. Training under Public Laws 16 and 346.

SPRAYBERRY ACADEMY of RADIO
Dept. 55-P

Sprayberry Building, Pueblo, Colorado, or
20 N. Wacker Drive, Chicago 6, Illinois



Trained Radio men can step into their own profitable Radio Service Shop

NOW!

**TWO LOCATIONS
To Serve You Better!**

Mail Coupon to Location
Nearest Your Home

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason; unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

92-C DISTRICT NATIONAL BUILDING • WASHINGTON 5, D. C.

Patents

Trademarks

Copyrights

CLARENCE A. O'BRIEN & HARVEY JACOBSON
Registered Patent Attorneys

92-C District National Bldg., Washington 5, D. C.

Please send me copy of "Patent Guide for the Inventor" and also "Record of Invention" form. This request does not obligate me.

Name _____

Address _____

City _____ State _____

(Please write or print plainly.)

And to think they used to call me SKINNY!

Give Me 15 Minutes a Day and I'll Give You a NEW BODY

PEOPLE used to laugh at my skinny 97 lb. body. I was ashamed to strip for sports or for a swim. Girls made fun of me behind my back. THEN I discovered my muscle-building system—"Dynamic Tension." It turned me into such a complete specimen of MANHOOD that today I hold the title "The World's Most Perfectly Developed Man."

That's how I traded in my "bag of bones" for a barrel of muscle! And I felt so much on top of the world in my big new, husky body that I decided to devote my life to helping other fellows change themselves into "perfectly developed men."

What's My Secret?

When you look in the mirror and see a healthy, husky, strapping fellow smiling back at you—then you'll be astonished at how short a time it takes "Dynamic Tension" to GET RESULTS! "Dynamic Tension" is the easy, NATURAL method you can practice in the privacy of your own room—JUST 15 MINUTES EACH DAY—while your scrawny shoulder muscles begin to swell, those spindly arms and legs of yours bulge, and your whole body starts to feel "alive," full of zip and go!

Thousands are becoming marvelous physical specimens—my way. I give you no gadgets or contraptions to fool with. With "Dynamic Tension" you simply utilize the dormant muscle power in your own body—watch it increase and multiply into real, solid LIVE MUSCLE.

FREE BOOK

Mail coupon right now for my illustrated book, "Everlasting Health and Strength." Tells all about my "Dynamic Tension" method. Shows actual photos of men I've made into Atlas Champions. It's a valuable book—and it's FREE. Mail coupon to me personally, CHARLES ATLAS, Dept. 1Q, 115 East 23rd St., New York 10, N. Y.

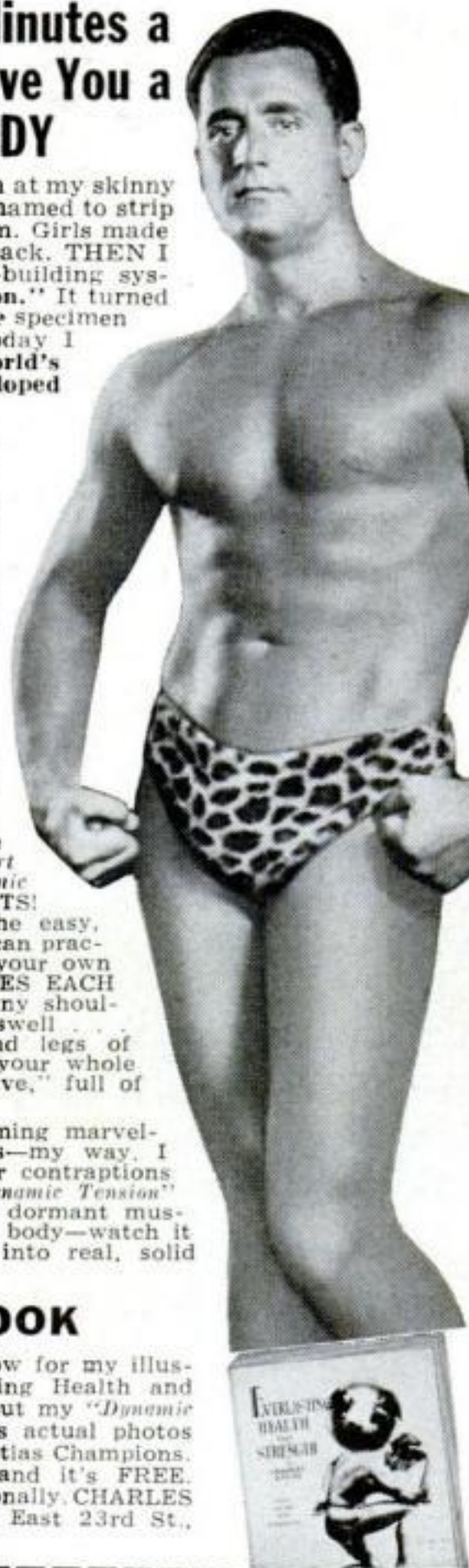
CHARLES ATLAS, DEPT. 1Q,
115 East 23rd Street, New York 10, N. Y.

I want the proof that "Dynamic Tension" will help make a new man of me—give me a healthy, husky body and big muscle development. Send me your free book, "Everlasting Health and Strength."

Name.....Age.....
(Please print or write plainly)

Address.....

City.....State.....



Letters



How Jets Work

Sir:

In jet propulsion, is the plane driven through the air by the force of the jet exhaust pushing against the air or solely by the reaction of the expanding gas?

Will you also make clear, in layman's language, how jets and rockets can function in a vacuum?

JAMES NOVARRO

Seattle, Wash.

Jet and rocket planes are driven through the air because of Newton's Third Law of Motion: For every action there is an equal and opposite reaction. A good example of this reaction is the kick of a shotgun. If you fire a shotgun while sitting in a canoe, the canoe will move backwards—you have a rocket-propelled canoe. You wouldn't say the shotgun pellets "push against the air," and neither do jets or rockets.

Jets will not operate in a vacuum, but only because they need the oxygen of the air to oxidize or burn their fuel. Rockets carry their own oxidizers in chemical form, and these actually work better in a vacuum.

Word Trouble

Sir:

My interest in photomicrography prompts me to call your attention to page 177 of the January issue where the word "microphotograph" is used to mean "photomicrograph."

LAWRENCE LENEY

Jamesville, N. Y.

The dictionary gives microphotograph and photomicrograph as loosely interchangeable, but in the strict sense Mr. Leney is right. A photomicrograph is a photograph of an object taken through a microscope; a microphotograph is a very small photograph.

Wrong-Way PS

Sir:

In your November issue, you ran an article called "Homemade Slingshot Launches Plane" [p. 146]. In this article you state

INVENTORS

Patent laws encourage the development of inventions.

We recommend that an inventor employ a registered Patent Attorney or agent, if the inventor is not familiar with patent matters. This is because the value of a patent depends largely upon the skillful preparation of the specification and claims in the patent application.

The firm of McMorrow, Berman and Davidson is registered to practice before the United States Patent Office. Additionally it engages patent attorneys able to readily understand inventors' disclosures, to advise concerning patentability, and to prepare appropriate specifications and claims.

If an inventor believes he has an invention, a search of the most pertinent prior U. S. patents should be made and a report obtained relative to its patentability. Where such report indicates that the invention appears patentable, in order to secure protection, diligence should be exercised in making application for a patent.

Send for a copy of Patent Booklet entitled "How To Protect Your Invention." This booklet contains information on patent protection and procedure. You will also receive an "Invention Record" blank. This will be promptly forwarded to you upon request—no obligation.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • TRADE MARKS • COPYRIGHTS

142-W VICTOR BUILDING, WASHINGTON 1, D. C.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

142-W Victor Building, Washington 1, D. C.

Send me your Patent Booklet, "How To Protect Your Invention", and also "Invention Record" form at once. I understand this request does not obligate me.

Name.....

Address.....

City.....

(WRITE OR PRINT NAME CLEARLY)

EXCITING VALUES FROM LAFAYETTE-CONCORD

AMERICA'S GREATEST RADIO MAIL
ORDER ORGANIZATION FOR 29 YEARS



SPECIAL ON PHONO-RADIO

worth 3 times this low, low price \$19.95

Never before have you seen a fine radio-phono combination at such an unheard of low price. You play up to 12" records... It's got the famous Alnico 5PM speaker and lots more you'd expect to find in sets 3 times the price. It's the buy of a lifetime. Complete with tubes. 1F417P, Shpg. wt. 15 lbs. \$19.95

NEW! DRAFTING MACHINE AN EXCEPTIONAL BUY!

Eliminates use of T-square, protractor, and triangles. Makes sharp, accurate drawings up to 16" x 22" Combination 90° angle, calibrated scale moves at any angle to any point on the masonite board. Includes 17½ x 23½ x ¼" board, steel arms, fittings, rubber feet. No. 18N15092P. Shpg. wt. 8 lbs. \$6.63



FOR MECHANICS, DRAFTSMEN,
DESIGNERS, INVENTORS, ETC.



NICEST IDEA OF THE YEAR BEDLAMP RADIO

FOR YOUR FAVORITE GAL

It's a beautifully-designed Bed Lamp & Radio combination. Enables her to read under light that's kind to her eyes—while she listens to her favorite band. Superhet circuit. Built in "air-magnet." Complete broadcast band coverage. AC or DC. Lamp has frosted lens for glareless light. Lamp and radio operated separately or together, as desired. Streamlined walnut bakelite. Brackets fit any type of bed. It's a \$29.95 value! No. 1-533P. Shpg. wt. 9 lbs. \$21.95



MORE THAN A TOY A REAL 1-TUBE RADIO

Here's an honest-to-goodness 1 tube set that plays anywhere, anytime. Picks up stations within 100 miles. Built like a telephone, dials like a phone, plays like any real portable radio. Safe for the tiniest tot—no electrical connections. Private earphone prevents Mama and Papa from horn-ing in on Superman. No. 33F24545P. Complete with tubes and batteries. \$4.75

100 WATT HEAVY-DUTY IRON



Now you can pick up a fine 100 watt Belden Iron, at nearly two-thirds off! Mfg. by Drake and Underwriter listed. Ideal for radios, switchboards and other "close quarter" work. Comes complete with 6 ft. cord, standard ¾" tip. Thousands sold at \$6.75! No. 99N8000P. Shpg. wt. 3 lbs. \$2.69

LAFAYETTE-CONCORD

LAFAYETTE-CONCORD Dept. KC-9
100 Sixth Avenue, New York 13, N. Y.
On mail orders you will be charged a few cents extra for postage.

- ☐ Please send me free catalog No. 89
☐ Please fill the attached order

Name
Address
City Zone State

that the plane always takes off up hill. Now I'll admit I don't know much about airplanes, but could you explain why he takes off up hill, when he uses a rubber shock cord to provide extra power for such a short runway?

RICHARD M. SCOTT

Cranbury, N. J.

The sentence was meant to read: "The plane always takes off from the uphill end of the field." In a last-minute bit of hurried editing the sentence—and the plane—got turned around.

Nothing New

Sir:

In the October issue on page 166 I found the article "Baby Carriage Makes Suitcase."

As there is nothing new in the world, I send you a picture [below] of the "Dodo" portable baby carriage. The carriage can be folded together in 5 seconds and taken in the car or the railway as luggage. It is made in Switzerland. I bought such a carriage for my boy, as the picture shows.

HUGO MARTHALER

Lucerne, Switzerland



Chilly Problem

Sir:

In the January issue, on page 106, J. B. Morris tells how he connected a radio, tuned it in to a dead spot, and then shut the refrigerator door to discover if the light went out. He could have learned the same thing in two seconds by opening the door of the refrigerator and touching the small switch in the door jamb. . . .

MABEL KRAUSHAAR

Woodmere, N. Y.

Sir:

. . . Use a 3-way socket and a short cord with a socket for a bulb. Take the cord out-



SEND FOR THIS FREE

180 PAGE CATALOG

A penny postcard will bring you the big, money saving, 1949 Lafayette-Concord catalog. There are 180 pages crammed with the latest developments in TV, Ham, AM and FM radios, P.A., kits, tools, etc. Write today for your free catalog.

Order by mail, or shop in person at any one of our outlets:

NEW YORK
100 Sixth Avenue
542 E. Fordham Rd.,
Bronx

CHICAGO
901 W. Jackson Blvd.
229 W. Madison St.

ATLANTA
265 Peachtree St.

BOSTON
110 Federal St.

NEWARK
24 Central Ave.

INVENTORS

A Patent is a Valuable Right. On the basis of a provision in the Constitution of the United States, Congress has established a system under which inventors may secure the exclusive right to prevent the unauthorized use, manufacture and sale of their inventions for periods of seventeen years. The inventor secures this protection for his invention by obtaining a United States Patent.

*T*his firm is registered to practice before the U. S. Patent Office and is available to assist inventors in the preparation and prosecution of their cases. Detailed information and the steps to be taken in obtaining patent protection will be furnished upon request.

Form below for mailing convenience

VICTOR J. EVANS & CO. • *Merlin M. Evans*
REGISTERED PATENT ATTORNEY
440-C MERLIN BUILDING, WASHINGTON 6, D. C.

VICTOR J. EVANS & CO. • *Merlin M. Evans*
Registered Patent Attorney
440-C Merlin Building, Washington 6, D. C.

Please send me without obligation a copy of your booklet "Patent Protection For Inventors" together with your convenient "Evidence of Invention" form.

Name.....

Address.....

City and State.....

PATENTS TRADEMARKS COPYRIGHTS
MARCH 1949 19

WORK FOR THE GOVERNMENT



Start as high as \$3,351 A YEAR

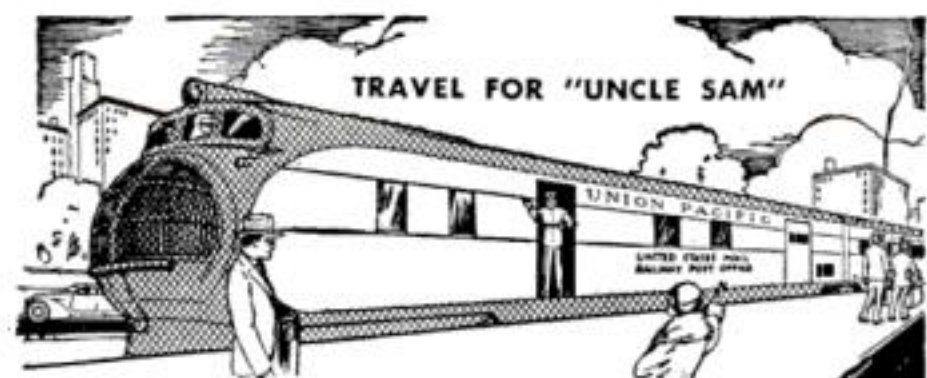
(Veterans Get Special Preference)
Get Ready Now for Next Examinations

City Mail Carriers, Post Office Clerks

Clerks and Carriers now get \$2,550 the first year of regular employment and automatically increase \$100 a year to \$3,550. Open to Men—Women 18 to 50. Clerks and Carriers can be promoted to other postal positions paying as high as \$7,550.00.

Railway Postal Clerks

Railway Postal Clerks get \$2,750 the first year of regular employment, being paid on the first and fifteenth of each month. (\$114.60 each pay day.) Their pay is automatically increased yearly to \$3,850 and \$4,050 in large organizations. Advance may be had to Chief Clerk at \$5,850 a year. Male Veterans only.



3 Days On—3 Days Off—Full Pay

Railway Postal Clerks on long runs usually work 3 days and have 3 days off duty or in the same proportion. During this off duty their pay continues just as though they were working. They travel on a pass when on business. When they grow old, they are retired with a pension.

Many Other Positions

Many other positions are obtainable. Rural Carriers—Stenographers—Typists—Patrol Inspectors—Assistant Statistical Clerks—etc. Those wishing these positions should qualify at once.

Get Free List of Positions

Fill out the following coupon. Tear it off and mail it today—NOW, at once.

Although not government controlled, this can result in your getting a big paid government job.

FRANKLIN INSTITUTE, Dept. M80, Rochester 4, N. Y.

Rush to me, entirely free of charge (1) a full description of U. S. Government Jobs; (2) Free copy of illustrated 40-page book, "How to Get a U. S. Government Job" with (3) List of U. S. Government Jobs; (4) Tell me how to qualify for one of these jobs.

Name.....

Address..... Veteran?.....

Use This Coupon Before You Mislaid it. Write or Print Plainly.

side the refrigerator and close the door. If the light goes out on the outside, the inside one is out, too. . . .

ROBERT JONES

Augusta, Me.

Sir:

. . . Simply open the refrigerator door and feel the light bulb; if warm, the bulb was burning after the door was closed; if cold, the bulb had been out. . . .

L. ROBERT SNYDER

Littlestown, Pa.

Jet Cockpit

Sir:

Your December issue (p. 113: "How Jet Jockeys are Made") says the jet cockpit is simple compared to that of a piston-engined plane.

Jets are simpler as far as power controls are concerned. The jet does not have propeller-pitch and mixture controls. Engine instrumentation, however, is not simpler. The manifold-pressure gauge and the coolant-temperature gauge have been replaced by tailpipe- and bearing-temperature indicators. A jet still has the fuel-pressure, oil-pressure, and oil-temperature gauges.

All in all, I do not agree that jet cockpits are simpler.

E. W. WOOD

Atlanta, Ga.

We'll concede that you say more precisely what we meant. The jet's instrument panel is crammed with indicators (as our picture showed), but its pilot doesn't have to operate as many controls as in a propellered plane. Consensus of fighter pilots is that the jet is, therefore, simpler to fly.

High Compression

Sir:

I enjoyed your articles on the new 1949 Cadillac and Oldsmobile high compression engines, but why didn't you mention the leader in the high compression field—Crosley with its 7.8 to 1 compression ratio?

BILLY MEEKS

Texarkana, Texas

Reader Meeks is right—as of today. At the time the Cadillac and Oldsmobile articles were written, however, the Crosley's higher compression had not been officially an-

Success from the start!

*Sets New
Performance
Standard*

*Amazing Resistor
does it!*



Here's what it does

A SMOOTHER ENGINE IDLE—WIDER SPARK GAP HELPS ELIMINATE OCCASIONAL MISSING.

IMPROVED GASOLINE ECONOMY—PERMITS BURNING OF LEANER MIXTURES AND REDUCES MISFIRING.

INCREASED ELECTRODE LIFE—UP TO 200% AND MORE.

IMPROVED RADIO RECEPTION—REDUCES SPARK PLUG INTERFERENCE WITH RADIO, RADAR AND TELEVISION.*

NEW AUTO-LITE

Resistor **SPARK
PLUGS**

Acclaimed by car owners coast-to-coast

SO REAL are the operating advantages of this scientific Auto-Lite development that car owners everywhere are replacing their regular type spark plugs with Auto-Lite Resistors.

Departments and taxi companies tell us of their enthusiasm for the smoother idle and improved gasoline economy experienced.

Car dealers, service station operators, garage men, Police

See your Auto-Lite Dealer today for a complete new set of Auto-Lite Resistor Spark Plugs.

Toronto, Ont. **THE ELECTRIC AUTO-LITE COMPANY** Toledo 1, Ohio

*Within 35 mv/m from 540 kc. to 150 mc. at 50 ft.
Auto-Lite Spark Plugs—Patented U.S.A.

BECAUSE OF ITS LOW RATE OF ELECTRODE EROSION, THE NEW AUTO-LITE RESISTOR SPARK PLUG PERMITS WIDER INITIAL GAP SETTINGS AND MAKES THESE ADVANTAGES POSSIBLE.

AUTO-LITE *Resistor* **SPARK
PLUGS**

MARCH 1949 21

MEN-IF YOU VALUE Your Future- read this FREE BOOK

SEND
FOR IT
Today!



Tells You How to Win Bigger Pay and Real Security

This book is yours without a penny of cost. "Your Future in Refrigeration and Air Conditioning" tells you what's in store for you in this fast moving, big pay field. No obligation. We want you to have this big, fascinating book. We want you to have the opportunity to read it—and to decide for yourself whether this is the field for you. You'll see pages of interesting pictures showing men on-the-job in Refrigeration and Air Conditioning. You'll read all about the fine opportunities in this amazing industry. This can easily be the most important book you'll ever receive and read—because it concerns your own future! Refrigeration and Air Conditioning has plenty of room for trained men—to handle good paying jobs in the many branches of this great industry. Almost unlimited future for men who know this work. Now you may learn Refrigeration and Air Conditioning at home in spare time. No need to give up present job or income while preparing to step into a better job. Act now! Simply write your name and address on the coupon below and mail today. Get your free copy at once . . .

INDUSTRIAL TRAINING INSTITUTE

2150 Lawrence Avenue, Dept. R-2, Chicago 25, Ill.

MAIL COUPON NOW No Cost No Obligation

Mr. C. H. Smith, President,
Industrial Training Institute, Dept. R-2
2150 Lawrence Avenue, Chicago 25, Illinois
Please send me a FREE COPY of "Your Opportunity in Refrigeration and Air Conditioning" by return mail.

Name.....

Address.....

City and Zone.....State.....

nounced. Crosley has been given proper credit in this issue on page 185.

Space Flying

Sir:

In "Riding the Ramjet" (January, p. 131), the final paragraph states: "flight into space beyond the earth, . . . by rocket . . . or ramjet." How can a ramjet work in space?

CLARKE BLAIR

Hagaman, N. Y.

You apparently missed this statement in the same article: "Since there is no air in outer space and the ramjet could no longer function, it could then be turned off. Then there would be a period of free coasting until reverse booster rockets were turned on to decelerate for a lunar landing."

No Sooner Said than Done



Sir:

In the January issue [p. 173], you mentioned a new idea in typewriter ribbons [inkless leaders on the ribbon ends, shown above at left]. Our new ribbon [above at right] has a clean silver end which will not soil the secretary's fingers. . . .

B. A. DEMING

The Carter's Ink Co.
Chicago, Ill.

Ferris Wheel Parks Cars

Sir:

In your Nov. 1948 issue (p. 122-123) you show an auto parking idea. Why not have large Ferris wheels with platforms in place of seats big enough to hold one auto each? Think what a small ground space would be taken. And even if your car is on top, there'd be no trouble in getting it.

LEO D. KELLER

Rochester, N. Y.

Want to be in **BUSINESS** for **YOURSELF**

or Get a Good Pay Job?



You Construct the Multi-purpose Shop Test Panel Shown at Left and Build **SCORES** of Radio Circuits Like Those Shown Below With the Parts I Send You.



Since 1929 I have been training men **ALL OVER THE WORLD** for success in radio. Find out how easy it is to learn right in your home through my two-way method - lessons plus actual practice. Send for big **FREE** book, **TODAY**.

H.R.T.I. Trained Men Win in Big Contest

FIRST, SECOND and FOURTH prizes in open contest for best Radio Technicians in Cuba **WERE WON BY HRTI** students and graduates! In fact, **SEVEN** of the first ten prizes were won by HRTI trained men! Over 250, graduates from many schools, as well as professional radio technicians, competed! Con-

vincing proof of the quality of HRTI training. Get the facts about this amazing contest in my big **FREE** book.

**APPROVED
FOR
VETERANS**
CHECK COUPON

BIG BOOK FREE

Sending for this book has marked the turning point in the lives of many men. You owe it to your future to find out about H.R.T.I. Training. Mail the coupon **TODAY**.

HOLLYWOOD RADIO & TELEVISION INSTITUTE
810 West 6th St., Los Angeles 14, California, U. S. A.



LEARN **Radio and Television**

Make Money in Spare Time While Learning at Home

Want to make more money? Want to be your own boss - have your own money-making business - with your future assured? Then learn Radio & Television with my proven 2-Way Method that can help you get into this great and growing business **QUICKER**.

Many of my students make money, some even start their own business in spare time - while learning.

Take the first step toward a successful career - **NOW** - send for my big 56-page illustrated book that tells how my home training can help prepare you to cash in on Radio and Television's opportunities. It's free, but it may mean your future success!

You Learn by Doing!

**YOU
GET 10 KITS
OF RADIO PARTS!**

**YOU DO OVER 300
FASCINATING TESTS**



You Build This 3 Tube
Experimental Re-
ceiver (above)
and This A-C
Power Sup-
ply (right)

You Also Construct This Powerful,
Four-Band, Six-Tube, A-C or D-C
Superheterodyne Receiver



During your training you get 10 big kits of radio parts with which you perform hundreds of tests and experiments, build scores of circuits and testers, to help you learn faster, more thoroughly.

You learn first hand, by doing.

MAIL COUPON NOW

C. H. MANSFIELD, Pres., Dept. D-16

Hollywood Radio and Television Institute, Established 1929
810 West Sixth St., Los Angeles 14, California, U.S.A.

Send me your **FREE** book, "Your Opportunities in Radio, Television and Electronics," which explains your 2-way home study training method.

No salesman will call.

NAME _____

ADDRESS _____

CITY _____ STATE _____

If a veteran of World War II, check here ☐

MORE PAY through HOME STUDY TRAINING in SPARE TIME

Do you want a better position—a larger salary? They are within your reach—now. LaSalle experts will guide you step by step in gaining business training which leads to greater earnings.

The time-saving, interesting LaSalle Problem Method helps you prepare at home, without interference with your present duties.

Simply mark on the coupon the field in which you desire success, and we will mail you a valuable book describing the opportunities in that field—plus "Ten Years' Promotion in One"—a book which has helped many men. Let us tell you how we have started thousands of average men and women on the high road to success and more money. Check and mail the coupon now.

LASALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 S. Dearborn St., Dept. 383-R, Chicago 5, Ill.

Send me full information regarding the course I have marked—without obligation—plus "Ten Years' Promotion in One."

- | | |
|--|---|
| <input type="checkbox"/> Higher Accountancy | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> C.P.A. Coaching | <input type="checkbox"/> Traffic Management |
| <input type="checkbox"/> Bookkeeping | <input type="checkbox"/> Foremanship |
| <input type="checkbox"/> Law: LL.B. Degree | <input type="checkbox"/> Industr'l Management |
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Stenotypy |
| | (Machine Shorthand) |

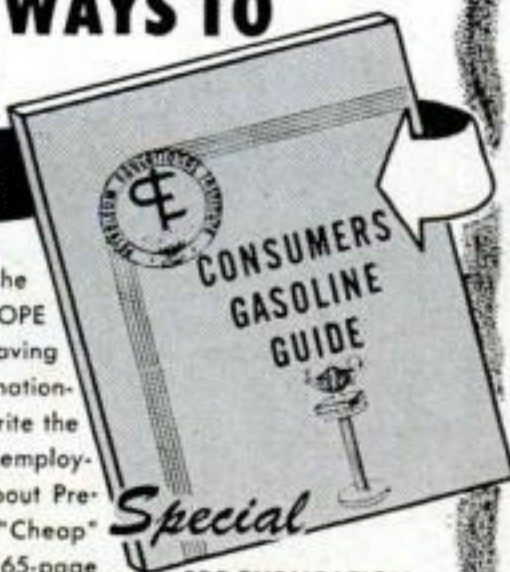
Name.....Age.....

Address.....

City.....Zone.....State.....

15 PROVEN WAYS TO Save GASOLINE!

YOU, the motorist, are for the first time given the INSIDE DOPE on gasolines in this money-saving book written by the same internationally-known authorities who write the training courses oil company employees study! Get the FACTS about Premium, Regular, Third, and "Cheap" Grades of gasoline from this 65-page "picture" book written in A-B-C language. Learn everything you MUST know to get the most gasoline mileage at the least cost!



PRE-PUBLICATION
OFFER
\$1.00 per copy

(Postpaid when remittance accompanies order)

Petroleum EDUCATIONAL INSTITUTE
820 EAST 60TH ST. • LOS ANGELES 1 • CALIFORNIA

CAN SAVE ITS COST IN FIRST DAYS' DRIVING

BE A POPULAR GUY



with a
RISEING TIE

Girls go into hysterics as your tie goes up and down. Your friends will be held spellbound and remain fascinated for hours. A simple adjustment makes your tie rise and fall at will. This adjustment can be made in a few seconds on any tie. No hands, no bulbs used. Take a deep breath and say "ah" and you are a popular guy. No one can discover the secret of the rising tie.

Free Catalog of 25 amazing tricks included with every order. **MAGIC CENTER** World's Largest Magic Shop Dept. PS-3 741 Eighth Ave., New York 19, N. Y.



RENOVATE YOUR JACKET

Lengthen the life of your old leather jackets at manufacturer's wholesale rates. They will look like new when our service department repairs, cleans and restores the leather to its original shade and finish. Send for FREE descriptive circular and itemized price list today!

BERLEW MANUFACTURING CO., INC.

Dept. 5

Merrick, New York

WATCH REPAIRING

BE A MASTER WATCHMAKER!

Graduates earn big money—many in business for themselves. The famous Sweazey System of Instruction teaches you quickly and easily. Our 41st year. Write today for free information.

CHICAGO SCHOOL OF WATCHMAKING

Dept. 439

1608 Milwaukee Ave.

Chicago 47, Illinois

FREE BOOKLET—For Those Who Suffer From

TOOTH DECAY!

Tells What You Can Do About It

Learn the amazing story of Deaf Smith County, Texas, where tooth decay is practically unknown. The booklet, "The Trail Began in Texas," will be sent you absolutely free. Just write your name and address on a penny postcard and mail to: L. M. & W. Company, Box 309-D, Marshall, Mich.

**NATION'S
LARGEST
EXCLUSIVE
ELECTRICAL
SCHOOL**

"LEARN-BY-DOING"

ELECTRICITY

**PRACTICAL TRAINING
NOT "HOME STUDY"**

G.I. APPROVED

Get actual experience in great shops of M.T.I. Learn all phases Practical Electricity; Housewiring, Motors, Const., Maintenance, etc. Living arrangements, Part-time jobs, etc.

Send coupon TODAY.

MICHIGAN TECHNICAL INSTITUTE ☐ Veteran

2281 W. Fort St., Detroit, Mich., Dept. PS-3

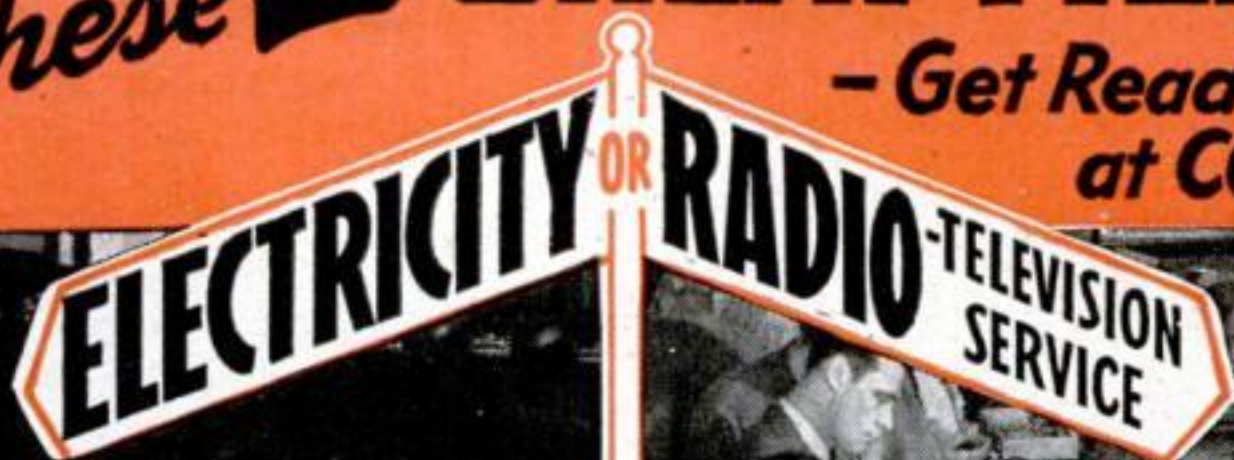
Name.....

Street.....

City.....State.....

Choose one of these 2 GREAT FIELDS

— Get Ready **QUICK** at **COYNE!**



This big fire-proof building is occupied entirely by Coyne.

Prepare for Success Quickly... in the

GREAT SHOPS OF COYNE

Conditions today are different. Many "one-operation" jobs that pay well will not last. Plan for steady pay and advancement by training NOW. Come to the great shops of COYNE in Chicago, for "all-around" training in Electricity or Radio-Television—the 2 great opportunity fields.

NOT "HOME-STUDY" COURSES

Our famous "Learn-by-Doing" method gives you practical experience on a massive outlay of equipment. Not by correspondence, but actual shop work plus necessary theory. You are trained right here in the great Coyne shops that has been training men and young men for over 49 years.

ELECTRICITY RADIO-TELEVISION SERVICE

INCLUDING INDUSTRIAL ELECTRONICS

Big future in Power Plant Work, Motors, Armature Winding, Home and Factory Wiring, Appliances, Refrigeration, Maintenance, Illumination, etc. Electricians are in demand everywhere—lifetime job service to Coyne graduates. Send for BIG FREE BOOK.

A great field now, even greater growth ahead. Here at COYNE you're trained for Construction, Testing, Trouble-Shooting on Radio, Public Address, Sound Picture Units. Training includes FM, Television Servicing, etc. Our training is quick, easy, practical. Many Coyne trained men own well-paying radio businesses of their own.

LARGEST, OLDEST, BEST EQUIPPED SCHOOL OF ITS KIND IN THE U.S.

Pick Field You Like

—Mail Coupon for
Big FREE Book



Whether you prefer Electricity, or Radio, train on actual equipment, at Coyne. We have a big, fully illustrated book on each course, and we'll send you the one you want, without obligation. Mail coupon — TODAY.

50th
ANNIVERSARY
YEAR
Founded 1899

ELECTRIC REFRIGERATION

Added training in Electrical Refrigeration can now be included.

G. I. APPROVED

NON-VETERANS who are short of cash can finance most of their tuition and pay in easy monthly payments after graduation. Many earn while learning.

B. W. COOKE, President

**MEN OF
DRAFT AGE!**

Coupon brings our special plan for men who may be called for U.S. service.

COYNE ELECTRICAL AND RADIO SCHOOL
500 So. Paulina Street, Dept. 39-73H, CHICAGO 12, ILL.

B. W. COOKE, President
COYNE ELECTRICAL AND RADIO SCHOOL
500 S. Paulina St., Dept. 39-73H Chicago 12, Ill.

Send me your BIG FREE BOOK—for the course checked below, including plans for men of draft age. This does not obligate me and no salesman will call.

☐ ELECTRICITY ☐ RADIO—TELEVISION

NAME.....

ADDRESS.....

CITY.....STATE.....

LIFETIME GUARANTEE CERTIFICATE SENT WITH EVERY BINOCULAR



ARMY—NEW
COATED \$48.95
6 x 30

Made for the U. S. ARMY. They Had To Be Good! BRAND NEW. Light-weight. Coated Optics. Individual Focussing. Complete with quality fleece lined leather case, and straps. Add 20% FEDERAL TAX.



MILITARY TYPE BINOCULARS

6x25\$26.75
8x30\$34.75
7x50\$44.00
7x50 Coated\$54.00
10x50\$57.50

Made to rigid military specifications. Five to choose from. For top quality performance, consider these all purpose 6x25, 8x30, 7x50 and 10x50 binoculars. All have superb optics, light-weight metal bodies. Individual focusing. Moisture and dust proofed. These brand new glasses come complete with genuine leather, plush lined case and straps. Coated price means entire optic system is precision coated. Superb binoculars. Add 20% FOR FEDERAL TAX.

6 x 30 U. S. ARMY

Fully reconditioned and refinished like NEW! Individual focussing. 6x30 binoculars made for the U.S. Army—they had to be good! Complete with NEW case and straps. ADD 20% for Federal tax. **\$39.50**

BINOCULARS (4-16 POWER)

4x40 Conestoga, New	\$ 7.95
6x30 Bausch & Lomb, New, Coated, USN	65.00
6x30 Bausch & Lomb, U. S. Navy, Used, Coated	55.00
6x30 Bausch & Lomb, U. S. Navy, Used	45.00
7x50 U. S. Army, NEW, Coated	78.00
7x50 German Zeiss, Used, COATED	85.00
8x30 German Carl Zeiss, NEW, Coated	98.00
8x30 Monte Carlo, New	29.95
9x40 Monte Carlo, New, Wide Angle	47.50
10x35 Monte Carlo, New	47.50
12x38 Monte Carlo, New	54.50
12x30 German Schatz 17 Ozs. Like NEW	100.00
16x45 Monte Carlo, New	67.50
16x40 German Carl Zeiss, 22 Ozs. Like NEW	135.00
30x53 Telescope, New, (No tax)	29.50
10x-20x-30x-40x Variable Telescope, New	47.50

Binocular cases and straps included. Add 20% for Federal Tax.

MONEY BACK GUARANTEE

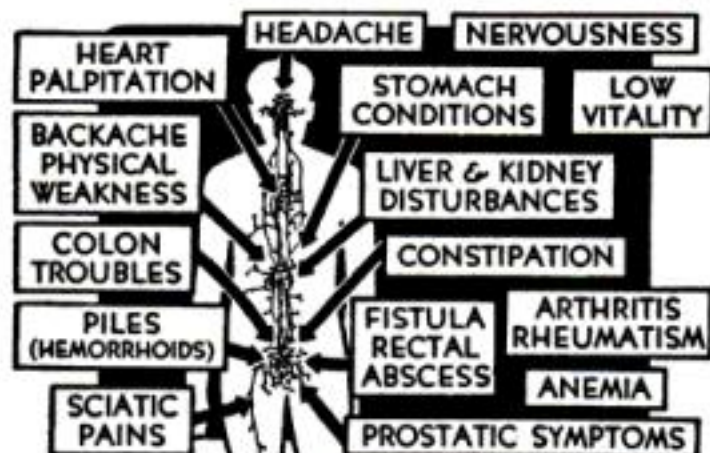
Use at our risk and expense! If not fully satisfied, return for a full refund. ORDER TODAY! Send \$2.00 deposit and we will ship C.O.D. for the balance. Cash orders shipped prepaid.

UNITED PRODUCTS CO.

7941 So. Halsted Dept. ARF-1216 Chicago 20, Ill.
(Reference Dun & Bradstreet)

Get Facts About Fistula — FREE

**NEW BOOK—Explains Causes
and Latest Treatment**



Illustrated, authentic 40-page book on Fistula, Piles (Hemorrhoids), related ailments as shown in diagram and colon disorders is yours FREE. Send postcard to Thornton & Minor Clinic, Suite 349, 926 McGee St., Kansas City, Mo.

STUDY AT HOME

With An Educational Institution

Men with specialized training win higher positions, insure larger earnings, and are bigger successes in business and public life. Opportunities NOW greater than ever before. Send for our Catalog.

ARTS and SCIENCES

Courses in Philosophy; Education; Letters; Public Health; Medical Jurisprudence; Psychology; Sociology; Physics; Chemistry; Plastics; Geology; Political Science; Theology; Business and Commerce; Accounting; Mathematics; Statistics; Agriculture.

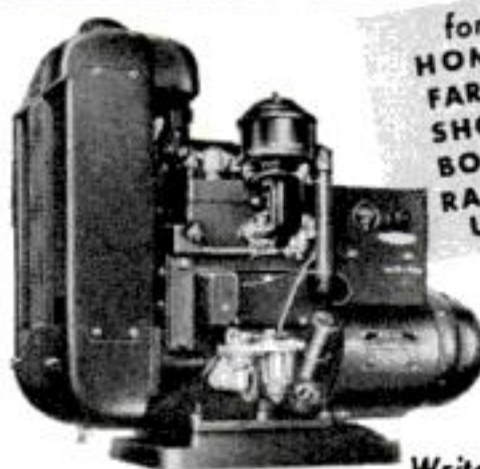
ENGINEERING

Courses in Electrical, Civil, Mechanical, Drafting, Architectural, Steam, Aeronautical, Radio, Structural, Mining, Industrial, Petroleum, Marine, Chemical, Diesel, Automobile, Refrigeration, and Air Conditioning Engineering.

LAW

Complete Professional Law Course includes 18 Hornbrook Series college grade textbooks. Courses also in Commercial Law, Patent Law and Medical Jurisprudence.
McKinley-Roosevelt Incorporated, 4610-AB, Sheridan Rd., Chicago 40, Ill.

ELECTRICITY Anywhere



for
HOMES
FARMS
SHOPS
BOATS
RADIO
USE

Onan gasoline-engine-driven Electric Plants supply reliable, economical electric service for any use. Portable, stationary or stand-by models. Water or air-cooled, compact and rugged.

A.C.: 350 to 35,000 watts in all standard voltages and frequencies. D.C.: 600 to 15,000 watts, 115 and 230 volts. BATTERY CHARGERS: 500 to 3,500 watts: 6, 12, 24, 32 volts.

Write for folder

D. W. ONAN & SONS INC.

2793 Royalston Ave., Minneapolis 5, Minn.



NEW! MINIATURE DUST MASK

Wear when sanding, grinding, paint spraying, sweeping, dusting, furnace cleaning, etc. Handy as a pair of glasses. Just keep mouth closed and breathe through nose is all you do to operate. Protects against dusts, lint, coal, cement, grain dust. Has 9 sq. in. filter.
Order today.

JERRY BRYANT, Dept. PS, 919 N. Michigan Ave., Chicago 11, Ill.



LABORATORY TECHNICIAN

BE A LABORATORY SPECIALIST; complete course. Big demand from hospitals, doctors, clinics. We teach all branches of medical laboratory work, including Medical and Dental X-Ray.

Approved by American College of Medical Technologists
Co-educational Free Placement Bureau
Free Catalog—Accredited for "veteran" training

CHICAGO COLLEGE OF LABORATORY TECHNIQUE
Dept. P.S. 431 S. Wabash Ave. Chicago 5, Illinois



MECHANICAL DENTISTRY

To make Crowns, Plates, Bridgework, etc., for Dentists. Easy practical way to learn mechanical dentistry at home in spare time. FULL EQUIPMENT OF TOOLS AND MATERIALS INCLUDED WITH COURSE. Low tuition. Easy terms. Write for FREE BOOK about this money making profession that is not affected by the machine age.

McCARRIE SCHOOL of Mechanical Dentistry
207 N. Broad St. Dept. 884 Philadelphia, Pa.



FREE
7-DAY TRIAL!
Return and Pay Nothing
If Not Completely Satisfied

**MOTOR'S
AUTO
REPAIR
MANUAL**

Now Any **AUTO REPAIR JOB**

Can Be "Duck Soup" For You!

See How to Repair—Quickly and Easily—Any Car Built Since 1935! Over 200,000 Service and Repair Facts—More than 1700 "How-to-Do It" Photos, Drawings, Diagrams! Over 200 "Quick-Check" Tables! 700 Pages of Easy, Step-by-Step Instructions!

HERE'S the huge, illustrated "How-to-Do-It" volume you NEED to "whiz through" any service or repair job on any make or model car built from 1935 to 1948! Save work on those "ornery" jobs that can be such a "headache!" Make MORE money by doing more jobs in LESS time!

Whether you're a trained specialist or a beginner mechanic, you'll quickly get the "know-how" from MoToR's Auto Repair Manual. Just look up the make, model and job in the Instant-Reference Index. Then go to it! Easy step-by-step pictures make every operation "duck soup" for you!

LIKE 150 SHOP REPAIR MANUALS IN ONE!

Here, in detailed "Quick-Reference" tables and concise "How-to-Do-It" words and

pictures, are the official facts and instructions you MUST HAVE to tune up, service or repair any car! Priceless help that saves you "guess-work"—eliminates trial and error!

Factory engineers from every automobile plant in America worked out these time-saving standard procedures for their own motor car line. Now the editors of MoToR have gathered together this wealth of "Know-How" from over 150 Official Factory Shop Manuals, "boiled it down" into clear, readable terms in one handy, indexed book!

EVERYTHING YOU'LL NEED TO KNOW

MoToR's Manual takes nothing for granted. Starts at the very beginning; tells you how to identify all 653 car models. More than 1700 easy-to-follow Photos, Drawings, and Diagrams guide you step-by-step right through each operation. 700 big, readable pages are crammed with Factory Specifications and Adjustment Tables, Tune-Up Charts, Tables of Measurements and Clearances, Overhauling and Replacement facts, and much MORE!

SEND NO MONEY

Just mail coupon! When the postman brings book, pay him nothing. First, make it show you what it's got! Unless you agree this is the greatest time-saver and work-saver you've ever seen—return book in 7 days and pay nothing. Mail coupon today! Address: MoToR Book Dept. Desk 23, 250 West 55th Street, New York 19, N. Y.

Published by MoToR, The
Leading Automotive
Business Magazine.

Used By
U. S. Army
and Navy

COVERS ANY CAR BUILT SINCE 1935!

Auburn Cadillac
Austin Chevrolet
Chrysler Buick
Cord Crosley
De Soto Dodge
Ford
Frazer
Graham
Hudson
Hupmobile
Kaiser
Lafayette
La Salle
Lincoln
Mercury
Oldsmobile
Nash
Packard
Pierce Arrow
Plymouth
Pontiac
Reo
Studebaker
Terraplane
Willis

ABOVE: Showing operation of Buick Dyna-Flow — and, BELOW: How to adjust Ford Clutch. Every moving part is covered in simple words and BIG, CLEAR 8 1/2" x 11" Pictures.

Just 2 of the Many Letters of Praise



"MoToR's Manual paid for itself on the first 2 jobs, and saved me valuable time eliminating guesswork." — W. SCHROP, Ohio



"Instructions so clear have no trouble learning anything about any car. Now working as mechanic in big plant." — SAM ORDÓÑEZ, Cal.

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MoToR BOOK DEPARTMENT
Desk 23, 250 West 55th Street, New York 19, N. Y.

Rush to me at once: (Check box opposite book you want)
☐ MoToR's AUTO REPAIR MANUAL. If O.K. I will remit \$1 in 7 days, (plus 35c delivery charge), then \$2 monthly for 2 months, and a final payment of 95c a month later. Otherwise I will return book postpaid in 7 days. (Foreign price, remit \$8 cash with order.)
☐ MoToR's TRUCK REPAIR MANUAL. (Described at left.) If O.K. I will remit \$2 in 7 days, and \$2 monthly for 3 months, plus 35c delivery charge with final payment. Otherwise I will return book promptly. (Foreign price, remit \$10 cash with order.)

Print Name.....Age.....

Print Address.....

City & Zone No.....State.....

SAVE 35c delivery charge by enclosing WITH COUPON check or money order for full payment of \$5.95 for Auto Manual (or \$8.00 for Truck Manual). Same return-refund privilege applies.

Same FREE Offer on MoToR's TRUCK MANUAL

Covers EVERY job on EVERY truck made since 1936! 1400 pictures, 952 pages, 300,000 facts. All types Gasoline Engines, Truck Diesels, Hessel-mans, Fuel Systems, Governors, Lubrication, Ignition, Starters, Clutches, Axles, Brakes, etc., etc. ALSO covers many buses, tractors, contractor and road building equipment, stationary power machinery. Check box in coupon.



LINGUAPHONE



is your *Passport*
to the World

In your own home, alone or in a group, you can now learn to speak

**SPANISH • PORTUGUESE
FRENCH • RUSSIAN
ITALIAN • GERMAN**

or any of 23 other languages by the world-famous

LINGUAPHONE Conversational METHOD

You learn the new language by listening to voices of native teachers. It is amazingly simple; thousands have succeeded. Educators hail Linguaphone as a notable advance in simplifying the mastery of languages. That is why so many Linguaphone Sets are used in schools, colleges, universities, as an aid to fluent speaking.

**Available to Veterans under
G I BILL OF RIGHTS**

SEND FOR FREE BOOK
LINGUAPHONE INSTITUTE
95 RCA BUILDING, NEW YORK 20, N. Y.

LINGUAPHONE INSTITUTE

95 RCA Bldg., New York 20, N. Y.

Send me the FREE Linguaphone Book.

I am ☐, am not ☐ a World War II Veteran

I want to learn.....language.

Name

Address..... City.....



**THERE'S
MONEY
IN**

CARTOONS!

DON'T COPY—LEARN TO ORIGINATE!

RAYE BURNS will teach you HOW to CREATE ORIGINAL
CARTOONS at home that you may SELL!
Course contains 26 lessons and over 600 illustrations. All for only **\$285**
Send name and address for free details.

RAYE BURNS SCHOOL, Dept. S, Box 3583, Cleveland, Ohio

Learn **FINGERPRINTING
AND
IDENTIFICATION**

**IN YOUR OWN HOME
IN YOUR SPARE TIME**

Specially prepared correspondence courses make it easy to learn this fascinating study essential in the field of CRIME DETECTION.

Under the Private Correspondence School Law of Pennsylvania, Licensed by the Dept. of Public Instruction.



**PENNA. INSTITUTE
OF CRIMINOLOGY**

Dr. W. Nisson Brenner, Director
DEPT. NO. 18
Extension Division
135 So. 2nd Street
Philadelphia 6, Pa.

**FREE
Booklet**

On Request

Big NEW CROSLEY

OF
U.S.A.



Larger, longer body lines, new luxury interior appointments. And today's Crosley engine gives you even more power, more economy—up to 50 miles on a gallon of regular gasoline. Costs less than an 8-year-old, high upkeep used car! Prices range downward from the Station Wagon at only \$929 F.O.B. Marion, Indiana. Five beautiful new models.

CROSLEY
a FINE car

For complete new catalog, write:
Crosley Motors, Inc.,
2530-JC Spring
Grove Avenue, Cincinnati 14, Ohio.

Learn BAKING at home

Baking is one of America's high industries in wages. Not seasonable, but year 'round good field for trained and experienced men. Thorough basic spare time home study course lays solid foundation. If you have the aptitude for this type of work, send for FREE Booklet, "Opportunities in Commercial Baking."

NATIONAL BAKING SCHOOL
1315 S. Michigan Ave., Dept. 1363, Chicago 5, Ill.



**PATENTS AND INVENTIONS
FINANCED, MARKETING AND
PUBLICIZED**

Irwin F. Mills Associates
Business Consultants
Public Relations Counsellors

19 W. 44 St.

New York 18, N. Y.

HANDBOOK OF AIRPLANE MAINTENANCE & OPERATION

Easy self-study course and up-to-date reference manual in one low-priced book! Covers basic principles and functions, construction, repair and maintenance of every part of the modern airplane. 512 pages, 600 pictures, over 300,000 words! 2,500-item index! Specification data sheets of world's leading types of aircraft. Only \$5.00—refunded if not fully satisfied after week's trial.

NATIONAL AERONAUTICS COUNCIL, Inc., Dept. 803
37 West 47th Street New York 19, N. Y.

CODE SPEED SHORT CUT

Be a code expert. Learn to be an Amateur or Radio Operator the newer, streamlined way—the Candler way. Qualify for amateur or commercial license. Have skill and speed in sending and receiving code this easy, faster method. Intensely interesting hobby or profitable occupation. You can learn at home or wherever you are, quickly, easily with the famous Candler Speed System—the System that makes champions. Send for book of particulars **FREE**.

CANDLER SYSTEM CO., Dept. 6-C, Box 928, Denver, Colo., U.S.A.

Projects in WOODWORK

One of the best woodworking books offered today. Detailed drawings for 109 projects, including bookends, game boards, waste baskets, child's rocker, trellis, book racks and furniture are given in PROJECTS in WOODWORK by Douglas & Roberts. For beginners as well as advanced craftsmen. Photographs clearly show "step-by-step" procedure. At craft or book stores or direct. Only \$3.50. Postpaid, or sent C.O.D. plus postage. Cloth cover. Order today. **McKNIGHT & McKNIGHT, 141 W. Market St., Bloomington, Illinois**

EVEREADY^{BRAND} the battery

with "NINE 9 LIVES"



Just as an
active cat...



takes a cat nap
and...



bounces back
with new pep... so
"Eveready" batteries
bounce back for
extra life!

● Naturally, when you use your flashlight, you use up some of the power in the batteries. But "Eveready" batteries recover power between uses—thanks to a reaction of chemicals in the batteries. Yes, "Eveready" batteries *bounce back* for extra life! Insist on "Eveready" batteries for your flashlight—they're the largest-selling brand in the world!

The registered trade-mark "Eveready" distinguishes products of
NATIONAL CARBON COMPANY, INC.

30 East 42nd Street, New York 17, N. Y.

Unit of Union Carbide **UCC** and Carbon Corporation



BUDGET-SAVING HAIR CLIPPER



THE VERSATILE

Cadet®

ELECTRIC HAIR CLIPPER

Put the practical "Cadet" Electric Hair Clipper to work . . . saves time and money for the whole family! You'll find this strong, yet inexpensive electric hair clipper mighty handy for removing superfluous hair, too. Special-design blade for clean, close cutting. Operates on 110 V., 60 cycle A.C. Fully approved by Underwriters' Laboratories. Only \$9.95 at drug, department, hardware and electric appliance stores. If your dealer cannot supply you, order direct from factory. Send check or money order. 5-DAY MONEY-BACK GUARANTEE.

ELECTRO TOOL CORPORATION

DEPT. C539-C • RACINE, WISCONSIN

**FREE
BOOK**
TELLS HOW
TO BE AN . . .

*Accountant
Salesman
Secretary
Stenographer*

SECURED FUTURE . . . FREE EMPLOYMENT SERVICE

Enter one of the "substantial earnings" fields through Hill's "Success Plan" training. A lifetime opportunity to join thousands of successful graduates in positions secured through our nation-wide employment service. No matter where you live, what you are doing now, Hill's can train you by study at home or in the resident school. Big Free book shows you the way to substantial earnings and an assured future. G. I. Approved.

Hill's Extension School & Business University
Dept. PS-39, 619 W. Main St., Oklahoma City 2, Okla.
Please send your free book, "Through Hill's to Success."

NAME

ADDRESS

CITY STATE

☐ Check here if eligible under G.I. Bill.
Please check course and training plan preferred.
Course: ☐ Resident ☐ Home Study

EASY-TO-USE COUPON TODAY

Famous BAILEY TECHNICAL SCHOOLS

OFFER THE FOLLOWING COURSES:

**PRACTICAL DIESEL ENGINEERING
REFRIGERATION - AIR CONDITIONING
COMMERCIAL ELECTRICITY
RADIO - TELEVISION MECHANICS**

Your future success depends largely on the reputation of the school you attend. Don't take chances! Train at America's foremost school of mechanical specialization. Bailey is recognized and approved by industry. Bailey graduates get the top pay jobs! G.I. Approved. Send for FREE Catalog.

BAILEY TECHNICAL SCHOOLS

1656 So. Grand Blvd., St. Louis, Mo.

WATCHMAKING

Be a Watchmaker—Be Independent

Get practical training at the only school in Chicago accredited by the Horological Institute of America and United Horological Association of America.

Day and Evening Classes—Approved for Veterans

Write today for free information

CHICAGO INSTITUTE OF WATCHMAKING

7 So. Pulaski Road

Dept. PS-3

Chicago, Illinois

SHOE REPAIR OFFERS BIG INCOME

LEARN IN 12 WEEKS TIME

You can own your own shop or earn big income as skilled shoe repairman. Growing demand everywhere at top wages for men who know how. We teach you quickly by actually working on shoes and modern machines. School open to all from 18 to 60 years of age. Free Big 20 Page Book explains everything. Send for your copy today.

MODERN SHOE REBUILDING SCHOOL

Approved for Vets. Established 1927 Dept. PS
2937 Belmont Ave., Chicago, Ill. RUSH POSTCARD TODAY!
806 So. Figueroa St., Los Angeles 14, Calif.

LOTS \$300 LOW TERMS

In California's loveliest Garden Spot, on scenic shores of beautiful Morro Bay. Enjoy future independence with excellent soil, soft water, wonderful fishing, hunting, boating, bathing, etc. Grow fruits, vegetables, poultry. Perfect temperate climate. Congenial community. Finest investment. Free literature.

RICHARD S. OTTO

Dept. PS

San Luis Obispo, California

235 FREE Books on Building

World's finest library of construction, maintenance, and remodeling information absolutely FREE. Nothing to pay for, nothing to buy. Penny postcards bring them to you by return mail. How to lick any building job—any building problem. Get expert advice free when you want it. For list of publishers order this amazing Directory of Homebuilding Information. Yours to look over free for 7 days. SEND NO MONEY. Just mail coupon for this EYE-OPENER to Westport Publishing Co., Westport 4, Conn.

Westport Publishing Co., Westport 4, Conn.

Send me Directory of Homebuilding Information on 7 days free trial, containing over 550 sources of building information, books, pamphlets, etc.

Name

Address

() Save postage. Send \$2 now. Money back if not delighted!



**LOW
FACTORY
PRICES!**

...on the Sensationally **NEW 1949**

MIDWEST RADIOS

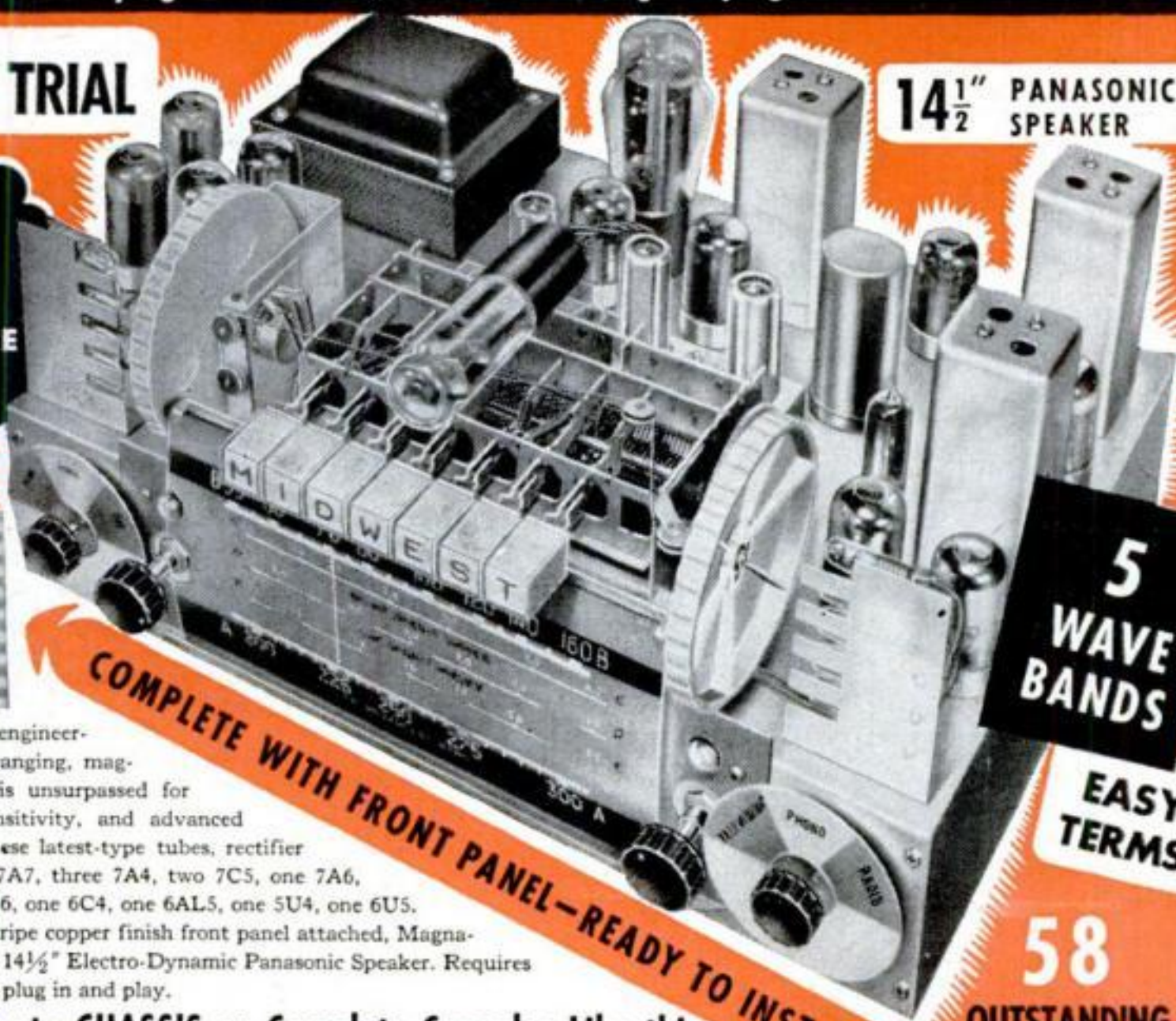
NOW Available with New Automatic

DUAL-SPEED RECORD PLAYER

For Playing Both Standard and LP (Long Playing) Records

30 DAYS TRIAL

**NEW
SERIES 16
SUPER DE LUXE
AM-FM
CHASSIS**



**14 1/2" PANASONIC
SPEAKER**

**5
WAVE
BANDS**

**EASY
TERMS**

58

**OUTSTANDING
FEATURES**

Including the
Exclusive Midwest
FLASH-O-MATIC
Volume and Band Indication
TELEVISION
Audio Switch-Over
FIDEL-A-STAT
Color-Ray Tone Selection
TRI-MAGNADYNE
Coil System
... Plus NO-DRIFT FM
and many other features

COMPLETE WITH FRONT PANEL—READY TO INSTALL!

Here is the last word in radio engineering . . . a powerful, world-ranging, magnificently-toned radio that is unsurpassed for performance, selectivity, sensitivity, and advanced engineering features. Uses these latest-type tubes, rectifier and tuning indicator: three 7A7, three 7A4, two 7C5, one 7A6, one 7Q7, one 6BA6, one 6BE6, one 6C4, one 6AL5, one 5U4, one 6U5. Comes complete with satin stripe copper finish front panel attached, Magna-Tenna Loop Aerial and giant 14 1/2" Electro-Dynamic Panasonic Speaker. Requires only a few minutes to install, plug in and play.

AVAILABLE in Separate CHASSIS or Complete Consoles Like this



Beautiful **SYMPHONY GRAND
AM-FM RADIO PHONOGRAPH**

with **NEW DUAL-SPEED
Automatic RECORD PLAYER**
For Both **STANDARD and LP RECORDS**

A Magnificent musical instrument and a masterpiece of cabinet design. Uses Series 16 Super DeLuxe AM-FM Chassis. Giant 14 1/2" Panasonic Speaker; Tri-Magnadyne Coil System; Built-in Loop Antenna. Other luxurious console and table model cabinets available with Series 16, 12 and 8 chassis—on Easy Terms and 30 Days Free Trial.

Rush for Free Catalog!

Send This Coupon Today—Write In Name and Address (Please Print) on Coupon or 1c Postcard

MIDWEST RADIO & TELEVISION CORP.

Dept. 248, 909 Broadway, Cincinnati 2, Ohio

Please send me your new FREE 1949 Catalog.

NAME _____

ADDRESS _____

CITY _____

ZONE _____

STATE _____

BUY DIRECT FROM FACTORY and SAVE!

MIDWEST RADIO & TELEVISION CORP.

Dept. 248

909 Broadway,

CINCINNATI 2, OHIO



**YOU
can
acquire**

LAW NIGHTS AT HOME! L. L. B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you learn by doing—handling legal problems—not by memorizing rules.

Send for two FREE 48-page booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 S. Dearborn St. Dept. 383-L Chicago 5, ILL.

Send me your two FREE booklets described above without obligation.

Name _____ Age _____

Street _____

City, Zone & State _____

Low-Priced **ROTARY TILLER**

**Unsurpassed
for Tilling
and Cultivating**



The Mulsifier Soil Tiller! Makes it easy to work 1 to 20 acres of common crops. Pulverizes the soil as fine as if it were plowed, disced and harrowed. Spreads fertilizer as it tills. Ideal for cultivating. Has adequate power for all workable soils. Travels at speeds up to 2 1/4 miles per hour. Nothing to do but guide it. Compact—can be carried in trunk of car. Completely equipped—no extras to buy. Sells at a fraction of the price of a tractor. Send postcard for circular.

MULSIFIER CORPORATION

7760 HAMILTON, DETROIT 2, MICH.

*Trade Mark Reg. U. S. Pat. Office

*Free
CIRCULAR*

Mulsifier
ROTARY SOIL TILLER



PAINTERS' STRIPING TOOL

NOW you can do your own expert striping on furniture, bikes, model planes, bulletins, autos, toys, signs, linoleum, wall board . . . make plain walls look like tile! It's easy to paint straight, curved, circular, even parallel lines with any color. Handiest paint tool in your workshop! Type "M" Master Painters' Striping Tool complete with tip for 1/16" stripe, \$1.00. Tool with choice of 1/64", 1/32", 3/64", 5/64", 3/32", 1/8" tip—\$1.50 . . . all tips 75c ea. Tool with complete set of 7 tips \$3.00. (COD's postage collect.)
WENDELL MFG. CO., 4234-A Lincoln Ave., Chicago 18, Ill.

**A TOOL . . .
NOT A BRUSH**

Dealers
Write
Today!

**\$1.00
POST
PAID**



Toolmaking PAYS Drafting BIG

You can train at Allied's Big Shops or Study at Home under Allied's Supervised Home Plan

Key Positions Open in Industry

- MACHINIST TRADE
- TOOL & DIE MAKING
- DRAFTING—ALL BRANCHES
- TOOL & DIE DESIGNING
- PRODUCT DESIGN & ILLUSTRATION

Established
in 1928

FULLY
APPROVED

Nationally Known, Endorsed by Industry
Write For Catalog—A 1c Postcard will do

ALLIED SCHOOL OF MECHANICAL TRADES
1338-1340-1342 So. Michigan Ave.

443 Allied Bldg.

Chicago 5, Ill.

ENORMOUS PROFITS CASTING AT HOME

Write today for NEW FREE CATALOG

Learn to cast thousands of perfect figurines, plaques, book ends, ash trays, etc. Start NOW—NO EXPERIENCE, LITTLE CAPITAL needed. Earn GREAT PROFITS with X.L. RUBBER MOLDS. X.L. Rubber. Pts. \$2.00; Qts. \$3.50; Gallons \$8.95; Models and enough rubber for 3 molds . . . \$1.00—plus postage.

PLASTIC ARTS STUDIO

Route 2, Dept. 3
MUNCIE, IND.



Learn RADIO-TELEVISION In Your Own HOME WORKSHOP

Build interesting Radio Circuits, acquire real experience, do scores of practical experiments—all through RTA's complete balanced training plus 10 BIG KITS of parts which RTA GIVES YOU! Get finest instruction direct from Hollywood, nerve-center of broadcasting, television and radio activities.

FREE BOOK
Send postal for complete details plus FREE BOOK "How to Make Good in Radio-Television."

RADIO TRAINING ASSOCIATION OF AMERICA
5620 Hollywood Blvd. Dept. 3-PS Hollywood 28, Calif.

HYPNOTIZE ANYONE



Yes, anyone. Learn modern speed hypnotism. Secrets revealed. Self-hypnosis. Exciting experiments. Overcome inferiority complexes, smoking, alcoholism, stuttering, nailbiting, phobias, insomnia, stagefright. Improve your memory. Private & class instruction available at Institute. Complete homestudy course . . . \$2

12" Hypnotism record inducing Mass-Hypnotism & Self-Hypnosis. \$5
POWERS INSTITUTE OF HYPNOTISM, 1324 Wilshire Blvd., Dept. 52, Hollywood 14, Calif.

The Success Story of Bill Smith... OR YOU!



Mails coupon to National Schools in Los Angeles, and receives Free Lesson and book of information about Radio, Television and Electronics training.



Enrolls... studies in spare time. Finds personal attention from instructors, interesting material and practical equipment, all increase his interest.



Builds actual units as part of Course. Earns money doing spare time repair and installation work.



Completes Course and receives Diploma... is now a qualified Radio, Television and Electronics Technician.



Applies for—and GETS—a good pay, full time job in industry. Finds that employers know National Schools and like to hire their graduates.



Or he opens own profitable Service Shop, with valuable counsel and aid from National Schools. Now for real happiness and success!



You Build This Superheterodyne Receiver With Parts We Send

You receive complete standard equipment, including latest type High-Mu Tubes, for building various experimental and test units. You progress step by step until you build a complete Superheterodyne Receiver. It is yours to use and keep.

Professional Multitester Included!

This portable instrument (see right) enables you to perform many practical tests, make delicate adjustments and do service work. Complete with test leads and batteries.

You receive a series of special laboratory experiment lessons to guide your practical exercises with your equipment. These lessons have been prepared with a special technique of illustrating radio principles by numerous easy-to-understand examples.

Both Resident and Home Study Courses Offered

Send Coupon Today for These Two Valuable Free Books



GET INTO RADIO, TELEVISION and ELECTRONICS by NATIONAL SCHOOLS SHOP METHOD HOME TRAINING

THIS PRACTICAL, TECHNICAL RESIDENT TRADE SCHOOL TRAINS YOU AT HOME FOR BIG RADIO OPPORTUNITIES!

Never in history has such rapid progress been made as in the great Radio, Television and Electronics Industry today! This exciting, fast-moving development means new and greater opportunities for the trained, skilled man—for you—in Television and Radio Broadcasting, Installing, Servicing; in Frequency Modulation; in Applied Electronics in many industries; in a business of your own!

National Home Training is Practical

Your National Schools Course fully covers basic, advanced and specialized instruction in all phases, including basic radio principles, receivers, am-

plifier systems, transmitters, television, aviation radio, electronics. You get complete instruction material, including shop manual, tube manual, job sheets, radio dictionary, special laboratory experiment lessons, experimental equipment. You receive complete, modern television lesson texts.

Your Home Study is supervised by our staff of highly trained instructors who daily teach our resident students here. Let the Free Books shown below tell you more about National Home Training. Use coupon today!

APPROVED FOR VETERANS

NATIONAL SCHOOLS

LOS ANGELES 37, CALIF. • EST. 1905



FIND OUT NOW... MAIL COUPON TODAY

National Schools, Dept. PS-R3 (Mail in envelope 4000 South Figueroa Street or paste on postcard) Los Angeles 37, California

Mail me FREE the book, "Your Future in Radio," and a sample lesson of your course.

NAME..... AGE.....

ADDRESS.....

CITY..... ZONE..... STATE.....

☐ Check here if veteran of World War II



WAR SURPLUS AND OTHER BARGAINS

Self-Priming ELECTRIC PUMP



Good for fuel pumps, fluid meters, coolant pumps, pressure lubricating pumps, oil burners, aquariums, general industrial use, etc. Can remove pump and use motor as high speed grinder, tool post grinder, etc.

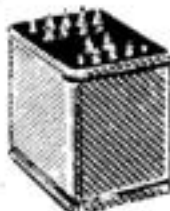
WELDON TOOL CO. PUMP with

standard 1/4" tubing ports, rated 2 G. P. H. **BLACK & DECKER MOTOR**. 1/75 H.P.; double ball bearing, series wound, continuous duty. Rated 12,000 R.P.M. Can be used on 24-32 VDC current or with transformer on 110 VAC line. SIZE: 7 1/4" long x 3 1/4" high x 3 1/4" wide. Wt. 5 lbs. Value more than \$50.00! **\$7.95** postpaid

SEND CHECK, MONEY ORDER or CASH

TRANSFORMERS

Jefferson Electric step up or step down transformer. Input, primary 110-117 Volts A.C. Output, from 5 Volts to 650 Volts. Suitable for use with war surplus gadgets, heater relays, radio test filaments, electric trains, house chimes, etc. Weight 10 lbs. New **\$7.95** Each



Automatic Winding Company Transformer. 60 cycles A.C. Input 75-125 volts. 4 step output 5-6.3 volts. Single winding. For radio, radar, television, chimes, and all low voltage gadgets. Wgt. 5 lbs. . . . New! Each **\$3.50**.

ALL PRICES F.O.B. CULVER CITY, CALIF.

MICROMETERS:

Chrome plated, precision engineered and carefully tooled to give long life, all new . . . 0-1" capacity, each **\$2.25**. 1-2" capacity, each, **\$3.50**. 2-3" capacity . . . each **\$5.50**.

FANCY BRIAR PIPES

We have been awarded 100,000 fancy briar pipes by Quartermaster Corps. Assorted shapes and sizes. All popular makes. Set of 7, **\$3.50**

POWER DRIVEN ANTENNA REEL:

1/2 H.P., G. E. Motor - 12-24 V. Removable 6" Reel. Cam worm gears, bevel gear. Solenoid clutch. In gear only when current on. Operates clockwise or counter clockwise. Ideal for power fish line, opening or closing doors, auxiliary power take-off. Can be used as buffing machine or for dozens of other uses. New! Weight 6 lbs. . . . **\$4.00** ea.

25% DEPOSIT REQUIRED ON C.O.D. ORDERS

CLAMPS—Adel Aluminum Co., Rubber lined, hundreds of uses in any shop. Assorted sizes, all new 5 Doz. **\$1 - 500 \$5**

CAR & TRUCK HEATER:

Can also be used in trailers, offices, darkrooms, homes or may be used as dryer. **DUMORE** Motor 1/6 cont. H.P., Amperage 7.5, RPM 6400, 24 V. Radiator type circulation, copper coils. Very efficient for car or truck heater when connected to battery. Simple installation. Wgt. 13 lbs. . . . New! **\$15.00**.

AIRBORNE SALES CO., INC.

DEPT. PSM 3-9
CULVER CITY, CALIF.

Can You Operate a Local Plant?



More local plants are badly needed to make Brikrete—the world's most modern masonry. Several hundred territories are being opened up for local Brikrete manufacture by men of vision and aggressiveness. Brikrete ties in with today's huge building program. Makes possible better construction at lower cost. Truly better than brick; actually cheaper than lumber. Combines strength, safety, insulation value, colorful beauty and modern styling.

Beauty • Long Life • Low Cost

Brikrete is made in locally owned plants, using local materials and local labor. That's why high quality and low price still permit a 100% to 150% mark-up. We supply complete equipment; easy terms if required. Generous cooperation. Exclusive manufacturing privileges in protected territory. Write or wire for information and tentative reservation of territory.



BRIKRETE ASSOCIATES, INC.
4675 S. Division, Grand Rapids, Mich.

BRIKRETE

BEFORE YOU BUY "ANY" TIRE—

CONSIDER YOUR FAMILY'S SAFETY—NOT JUST PRICE!

You don't have to hesitate in buying — You have seen our reliable adv. month after month

→ VETS TAKE 10% DISCOUNT. YOU CERTAINLY DESERVE IT ←

CHOOSE YOUR FAVORITE BRAND

GOOD YEAR

Firestone

Goodrich

U. S. ROYAL

AND MORE OF THE WORLD'S BEST BRANDS

SLIGHTLY WORN HIGH TREAD TIRES. NO RECAPS.

FREE BUTYL TUBE with all these **14 MONTH GUAR. BOND**

600-16	\$3.94	550-17	\$5.75	600-20	\$8.95	34x7	\$10.95
650-16	4.40	525-18	5.75	700-20	9.95	825-20	11.95
650-15	4.20	700-16	5.00	32x6 (8)	9.95	900-20	12.50
700-15	4.50	750-16	6.00	32x6 (10)	10.50	1000-20	12.50

"ALL-PURPOSE" CAR & TRUCK TIRES "TRIPLE-A"

GOLDEN-RULE GUAR. 24 MOS. AGAINST ANYTHING

600-16	\$5.50	525-18	\$6.75	600-20	\$9.95	32x6 (10)	\$11.95
650-16	5.50	550-17	8.00	650-20	10.25	825-20	15.45
650-15	5.50	700-16	6.50	700-20	10.95	900-20	15.45
700-15	6.50	750-16	6.50	32x6 (8)	10.95	1000-20	16.45

Whitewalls or 8 Ply Tires \$1 Extra 6-8-10-12-14 PLY

WE'VE SHIPPED TIRES TO CANADA, ITALY, CZECHOSLOVAKIA, ALASKA, PANAMA, PUERTO RICO, GERMANY, and SOUTH AMERICA. OUR TIRES USED ON SCHOOL BUS., AND AMBULANCES



750-20 MILITARY FIRSTS 32x6 700-20

8-ply Top Grade (Were \$9.75) \$9 Guar. 12 Mos.
Premium Grade (Were \$18) \$13 Guar. 26 Mos.
900-16 'A' \$7.75 900-16 'AA' \$10.75

Send check or money order & this ad for rush shipment. We won't ship a tire that we wouldn't use. Blatt Bros. have personally pinpoint-inspected 1/2 million tires. Please depend on us.

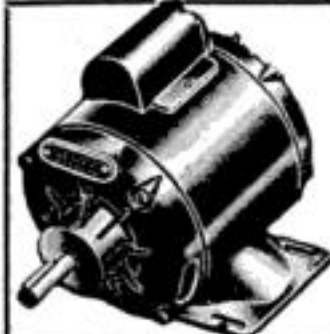
BLATT

GIRARD & LANCASTER AVE. Dept. P.S.
Blatt Bldg. PHILADELPHIA 31, PA.

MYSTERIOUS DEVICE WELDS ANYONE CAN OPERATE



This newly invented **FOUR-WAY PORTABLE ELECTRIC WELDER** will do brazing, soldering, welding and cutting on brass, bronze, iron, steel, cast iron and other metals. It's easy to use. **WORKS INSTANTLY** off any properly wired 110 VOLT A.C. OR D.C. LINE. Does a thousand and one professional type repair jobs. **SAVES TIME AND MONEY** on auto, home appliance, farm and shop repairs. Ideal for maintenance men, farmers, repair shops, engineers, tin smiths, home and auto owners, bicycle and fix-it shops. **10 DAY TRIAL OFFER. COMES COMPLETE WITH ALL SUPPLIES READY TO OPERATE** including instructions. **FULLY GUARANTEED.** Order today for 10 DAY TRIAL or write for FREE particulars. **FOUR-WAY WELDER CO. Dept. PSC-39 3180 North Clark St., Chicago 14, Illinois.**



SPECIAL BARGAIN GENUINE G.E. MOTORS

Capacitor Start, 3/8" Shaft
1/3 H.P. 1725 RPM \$20.50 fob
1/3 H.P. 3450 RPM \$21.75 fob
Brand New, in original Cartons
JOHN E. KANDLER CO.
210 N. Rose St., Kalamazoo, Mich.

ITALIAN ACCORDIONS



All types, all models, Very best. Hand Made, Lowest prices. Buy direct from Factory representative and Save Money. Also Button Accordions, Chromatic Accordions and Concertinas. Send name and Address for FREE catalog.

ITALIAN ACCORDION MFG. CO.

7600 Cottage Grove Ave., Dept. PS-3, Chicago 19, Ill.

HOT WATER BOTTLE HEATING UNIT



Special electrode-type heating unit screws into ordinary hot water bottle as illustrated. Gives Safe, even heat. Amazing relief for many ills where constant heat application is necessary. Every home needs this handy item. Underwriter's Laboratory approved. Thermostat control. Foolproof. Bakelite construction. Complete with 6' cord. An excellent gift. Send cash, check, money order and we pay postage. Only **\$3.95**. C.O.D.'s accepted. **FREE FOLDER.** **DEALERS and SALESMEN: Write for details THERMO ELECTRIC PRODUCTS CO., LTD. Dept. S-3 3725 San Fernando Rd. Glendale 4, Calif.**

Don't miss the chance of a lifetime!

TELEVISION

Radio - Electronics...

OFFER YOU A PROFITABLE FUTURE!

Get the Facts About Our

GREATEST OFFER in 17 YEARS

Here's good news . . . big news . . . our **BIGGEST NEWS** in 17 years. The equipment pictured at the right gives a partial idea of D.T.I.'s remarkable new combination of shop-method, home-training aids.

Now you can use and keep **ALL** of this equipment — **PLUS** other major training aids — to prepare you at home for a grand future in the fast-moving field of **TELEVISION . RADIO . ELECTRONICS**.

SEND FOR FREE BOOKLET

Mail the coupon today for our big, new 48-page **OPPORTUNITY GUIDE BOOK**. See how D.T.I.'s amazing, newer, training method helps you get started toward a **GOOD JOB** or your **OWN BUSINESS** in one of America's most promising, thrilling fields . . . that includes **Television . . . F.M., Train, 2-Way Taxi, Aviation, and Broadcast Radio . . . Industrial Electronics . . .** and other fast-developing branches.

In addition to well-illustrated lessons, you receive 16 shipments of Radio-Electronic parts from which you work over 300 instructive projects — including the building of (1) a commercial-type **CATHODE RAY OSCILLOSCOPE** that helps you get practical Television circuit training, (2) a double-range **R-F SIGNAL GENERATOR**, (3) a jewel-bearing **MULTI-METER** and (4) a quality 6-tube **SUPERHET RADIO**. You keep all of this equipment.

You also use HOME MOVIES

. . . a D. T. I. Exclusive!
D.T.I. alone includes the use of modern, visual training aid **. . . MOVIES . . .** to help you learn faster, easier at home. You see electrons on the march and other fascinating "hidden action" — a remarkable home training advantage that speeds your progress.



DeFOREST'S TRAINING, INC.
CHICAGO, ILLINOIS

*Affiliated with the De Vry Corporation
Builders of Electronic and Movie Equipment*

OSCILLOSCOPE

MULTI-METER

**YOU BUILD and KEEP
THIS EQUIPMENT**
Work over **300**
Home Experiments

EMPLOYMENT SERVICE

When you complete your training, our effective **Employment Service** is available to you without extra cost, to help you get started.

R-F SIGNAL GENERATOR

6-TUBE RECEIVER

You May Choose to Train in Our MODERN CHICAGO LABORATORIES

Train quickly, using a wide variety of commercial equipment. D. T. I.'s new labs are among the finest of their kind. Ample instructors . . . every major training advantage. Write for details!

MAIL THIS OPPORTUNITY COUPON NOW!

DeForest's Training, Inc.
2533 N. Ashland Ave., Dept. PS-F3
Chicago 14, Illinois

Send me **FREE** your 48-page **OPPORTUNITY GUIDE BOOK** showing how I may make my start in **Television — Radio — Electronics**.

Name _____ Age _____

Street _____ Apt. _____

City _____ Zone _____ State _____

Thousands of Parts
For Military

TRUCKS

We have for immediate delivery genuine parts for all makes and models. 4x2 - 4x4 - 6x4 and 6x6. All models from 1/4 ton to 20 tons. All makes: Autocar, Biederman, Brockway, Chevrolet, Diamond T, Dodge, Federal, Ford, GMC, International, Mack, Oshkosh, Reo, Studebaker, White, Willys, and Jeeps. We have parts lists available on most models. Write stating model of Truck.



JEEP TOPS and CURTAINS

(Weatherizing Kit), complete top with back curtain and side curtains with zip-in-doors, 5 windows. Waterproof O.D. color. shipping weight 40 lbs. Wonderful value. F.O.B., K.C. **\$34.50**



TRAILER AXLE

Heavy duty trailer axle suitable for many types of trailer construction. Also excellent for building of heavy farm trailers and wagons. It is a 15,000 lb. capacity square type straight

trailer axle complete with Timken roller bearings, hubs, and 6 hole 750 x 20 Budd Wheels. Without brakes. Axle is 2 1/2 inches square and 70 inches between wheel mounting flanges. Std. width. AN EXCELLENT BUY.

With Single Wheels **\$59.50** With Dual Wheels **\$69.50**

UTILITY GAS TANK

6 Quarts. New Surplus. Cylindrical 5 1/2" diameter, 15 1/2" length. Brackets for mounting in horizontal position. Complete with Filler cap in center, drain plug in bottom and pet-cock on end. Ideal fuel tank for small gas engines, stoves, etc. **99c**

TOW CABLE

15 ft. long, 1/4" thick. Steel with clevis and eye. Every motorist should have for emergencies. Shipping weight 2 1/2 lbs. **99c**

All prices quoted are FOB, Kansas City.
25% deposit required on COD orders.



UNITED AUTO PARTS CO. INC.
1901 TROOST GR. 1800 KANSAS CITY, MO.

Outstanding Surplus Value!

BRAND NEW - GUARANTEED

GRINDING WHEEL KITS

HUNDREDS OF ASSORTED ITEMS - A \$50 VALUE



FOR CUTTING,
SHAPING,
GRINDING,
& POLISHING
WOOD, METAL
OR PLASTIC.

\$8.95

While supply
still lasts, only

Per Complete
Kit

F.O.B. Chicago

SET INCLUDES OVER 300 ITEMS

25 Grinding and cut-off wheels, sizes
1 to 5 inches, 1/8 to 3/4 hole
10 Mounted stones - 3/32", 1/8", 1/4"
3 Steel cutters 1/8"
5 Steel cutters 3/32"
1 Steel circular saw mounted
on mandrel
1 Drum sander 1/2" mounted
on 3/32" mandrel
6 Cut-off Wheels on 1/8" mandrel
1 One inch buff on 1/8" mandrel
2 Leather wheels
1 Roughing stone
3 Honing stones
2 Felt bobs
10 Sanding rolls
6 Sanding sleeves

In sturdy compact container
13 1/4 x 9 1/4 x 2 1/2".
weight 8 1/2 pounds; with
installed rack for all drills.

1 Rag wheel - 4 inch

1 One inch felt wheel on 1/8" mandrel
1 7/8" rubber wheel on 1/8" mandrel
2 High speed rotary files 1/4" shank
100 3/4" cloth butterfly abrasive discs
1 One inch wire wheel 5/8" hole, brass
center
1 4" brush
1 Box paper discs - 100
1 Bristle brush 3", 5/8" hole, brass center

enclose \$8.95 ☐ Check ☐ M. O. ☐ Send C.O.D.

Name _____

Address _____

GROBAN SUPPLY CO. 1522 So. Michigan Ave.
Dept. PS-M, Chicago 5, Ill.

Order by Mail—Save Almost 50% 18 PC. REG. \$4.95 WRENCH SET



1/2" and 1/4" HEX DRIVE
Complete range of
14 socket wrench-
es 3/16"-15/16",
two offset han-
dles. Ratchet wrench and plug
adapter. Bright plated tools in
heavy metal case. 18 pc. Socket
Wrench Set. Add 30c Postage.

\$2.95

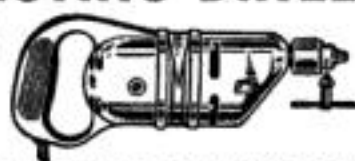
POWERFUL 1/4" ELECTRIC DRILL

NATIONALLY ADVERTISED

A Real "Buy"

At This Low Price

\$19.95



Equipped with 1/4" Jacobs geared
chuck and key. Net weight approx.
5 lb. A full size rugged shop tool.
Convenient handle type switch, perfect balance. Powerful 110
volt AC-DC motor, will not stall under heaviest pressure. 2200
RPM. Multiple ball thrust bearing made for tough continuous
service in shop or field. Perpetual factory guarantee assures you
of a lifetime of trouble-free use. We refund your money (less
transportation charges) if not pleased with drill after trial.
Add 80c Postage.

1/2" HEAVY DUTY DRILL - ONLY \$34.95

Jacobs Geared Chuck, minimum spindle offset, horizontal spade
handle and automatic release trigger switch with locking pin.
Detachable pipe handle, universal motor, 110 v. 550 RPM, net
weight 8 lbs. 3 conductor cable and plug. Add \$1.25 postage.

6 VOLT DYNAMOTOR—\$60 VALUE

POWER SUPPLY FOR
BOAT OR CAR RADIO

\$19.95



Output 600 V D C at 150 M A. Sufficient to
operate a transmitter or receiver or combination
of both. New! Compact. Size only 6" long by 5"
Diameter. Made by Pioneer. Buy now! Or pay
double later. Add \$1.25 postage.

ABELL DISTRIBUTING CO., Dept. 32

5 E. BIDDLE ST.

BALTIMORE 2, MD.



100% PROTECTION

TEAR GAS

A REAL SURE-FIRE SELLER! THUGS AND THIEVES BEWARE!

Here is a tear gas pencil gun which discharges smothering clouds
of tear gas to instantly stop, stun and incapacitate the most vicious
man or beast. A safe and effective substitute for dangerous fire-
arms. No permanent injury. Needed in Stores, Banks, Autos and
Homes, everywhere to protect Life and Property. No skill required.
Handle our tear gas as a side line and you'll soon give it full
time. For a quick start send \$3.60 for complete demonstrator out-
fit consisting of an Automatic Pencil Gun with 10 demonstrators
and 3 powerful Tear Gas cartridges fully guaranteed. Many thou-
sands now in use. Order your outfit today. Not sold to minors.

Hagen Supply Corp.

Dept. F-503

St. Paul 4, Minn.

NEW! SUN VISOR CARRY-ALL

Placed conven-
iently on the sun
visor, the all-metal CAR-
RYALL holds a cigarette
pack, cleansing tissues, toll
coins, maps and notes. Makes
motoring a pleasure.
Get yours today! Send only
\$1.00. We'll pay the postage

E. B. METAL PRODUCTS CO.
227 E. 144th Street, New York 51, N. Y.

AMERICA'S BIGGEST KAYAK VALUES!



LIGHT • STRONG

SAFE • SPEEDY

EASIEST TO BUILD!

No steaming or bending. Few tools.

SAFEST TO USE. Lowest possible center of gravity.
LIGHT WEIGHT! Easiest to handle—onto car or thru woods.
ECONOMICAL! Complete kit. Nothing else to buy.

Request Literature

DEDHAM KAYAKS, DEDHAM, MASS., Dept. A-93

NEW 1949

Plastics Supplies Catalog

Just off press. Full details on Plexiglas, Lucite, rods,
sheets, tubes. Acetates, cements, dyes, buffs, molding
sets, tools, carving kits, accessories. Everything in
plastics. Gives prices, sizes, colors, etc. Price 10c,
stamps or coin, with ad for catalog.

PLASTICS MFG. & SUPPLY CORP.

Dept. PS-3

4707 Euclid Ave.

Cleveland 3, Ohio

NOW EASY TO START A Big Business ON A SMALL INVESTMENT



WARNER SUCCESS PLAN

Gives exact instructions showing you

- How to start in spare time
- How to use home as headquarters
- How to bring in the business
- How to do real METALIZING in genuine GOLD, SILVER, or BRONZE, by the easy Warner Method
- How to start without risking your job
- How to pyramid your profits
- How to be sure of steady, big income.

Don't turn this page until you've given serious thought to your future. In the uncertain years ahead, the men who own their businesses are the ones who will be happiest. A small start now easily can lead you to complete independence, freedom from time clocks, freedom from fear of lay-offs, freedom from the limits of a pay check.

Now, while you can do it without risk—now is the time to investigate the exceptional opportunity offered you by the Warner Success Plan. Looking into the market, checking up on the possibilities for big sales and big profits will not cost you anything. Isn't this the time to lay the foundation for a future of complete independence—a life of happiness—a steady, dependable income?

METALIZING BABY SHOES AND OTHER KEEPSAKES

offers an exciting new opportunity to men or couples who want personal independence

If you'd like the feeling of being boss instead of being bossed—the Baby Shoe business is made to order for you. Just think of the appeal. A mother's love for her child—her desire to preserve forever the tiny shoes in which her baby took its first toddling steps. No wonder orders come easy and fast. No wonder profits are big. Then think of the Future. Fifteen Million babies in the last five years—three million last year—millions more next year. As long as babies are born, this business will prosper—in good times or bad. Think of the fun. Every job is different, interesting. And when you deliver a job and collect the money, you get a tremendous glow of satisfaction out of the mother's happy exclamations over your work. There's not another business I know of that offers you such big rewards in cash, in security, in a future, in independence that can be started on such a shoestring. You'll be glad you saw this ad—IF YOU SEND THE FREE COUPON.



READ THE ENTIRE PLAN

7 DAYS AT MY RISK

DON'T SEND A PENNY... Just Send Your Name

This is one of the most fascinating businesses you can imagine. There are 15 MILLION pair of baby shoes waiting right now to be METALIZED. The opportunities are unlimited. The future is very big. And it's a business in which the whole family can have fun helping. A perfect business for man and wife to start—or for two partners. And I want you to read the whole Plan at my risk. Don't spend a cent unless you go ahead.

I want every serious minded man to let me show what I've done in our own shops here in Chicago—reveal the exact facts about the profits to be made and the way to make them. I don't want you to spend a cent for supplies until you've studied the facts, talked them over with the family, and satisfied yourself that this is the ONE BIG OPPORTUNITY FOR YOU. That's why I allow you to read all trade secrets contained in the Warner Success Plan at My Risk. If you don't go ahead, you don't pay a cent.



WE SUPPLY EVERYTHING

You don't have to go "hunting" when Warner is behind you. We supply all materials, all mounts, chemicals, and metals. And you get the low prices made possible by our big quantity purchases and our own manufacture. You send for just what you need—and never have any big investment tied up in stock.



\$5.00 AN HOUR

Yes, it's possible for one man to turn out enough work to make \$5.00 an hour for his time. Think of how that pyramids when a partner or the whole family works.

Old Established Firm Backs You Up

The Warner Electric Company just celebrated its 26th year of success. You get a Real Start when you "join up with Warner"—you get real Guidance to Success.

Warner Electric Co., Dept. 23,
1512 Jarvis Ave., CHICAGO 26, ILL.

ALL FACTS FREE! MAIL!

Raymond E. Brandell, Mgr., Warner Electric Co.,
1512 Jarvis Ave., Dept. 23, Chicago 26, Ill.

As long as it doesn't cost me a cent, I'm willing to read the facts, investigate, and then give you my decision. Send the facts by next mail. No cost to me now or at any other time.

NAME _____

ADDRESS _____

CITY _____ Zone _____ STATE _____



**REGAL
Shoes
BY MAIL**

WRITE FOR FREE CATALOG

For real foot comfort, smart, distinguished appearance, and a perfect FIT... there's a Regal Shoe for you!

Regal Shoes are available in 90 sizes and widths — all brimful of the greater foot comfort an active man wants and needs. Now you can enjoy an easy-going, comfortable stride. All styles one low price, \$8.95.

Send for free illustrated catalog showing men's top quality footwear in a fine selection of leathers and handsome styles for dress, sport, and business wear. Mail orders promptly filled. Money-back guarantee of satisfaction.

REGAL SHOE COMPANY
Dept. 212 Whitman, Mass.

"PRE-SEASON" OFFER Make Ur Own Power LAWN MOWER

Just add Engine or Motor

- Lightweight "easy to operate".
- Cast aluminum base with 18" Rotary Blade (Hardened Steel).
- Ball-bearing rubber tired wheels.

Now is the time to install your own gasoline or electric motor on a well built new aluminum chassis. Will accommodate up to 2½ hp engines or ½ hp. motor.

WE can also furnish gasoline and electric power mowers at big savings. Inquiries invited.

Price F.O.B., K. C., Missouri. Send check or M.O. No COD's.

ATLAS EQUIPMENT CO.

229 S.W. Blvd. Dept. PS Kansas City, Mo.



Army Surplus Bargains

WALKIE-TALKIES

(Handie Talkies)

All are in very excellent condition, and complete with crystals (receiving & transmitting) and batteries. Are preset at various operating frequencies. We will supply units with matched frequencies on request. Each ..

\$39.50



TELEPHONES

Army Field

Just hook up terminals of two or more phones to any two-strand wire and you are ready to talk up to 17 miles. Ideal for home, shop, farms, etc. Used, excellent, in leather case. Each

\$7.95



CLIMBING EQUIPMENT

SAFETY BELT

Used, good leather..... **\$2.95**

POLE CLIMBERS

(Used, good) and straps..... **\$1.95** pair



Send 25¢ with Order. Balance C.O.D. All Equipment F.O.B. Write for Catalog.

C & H SALES CO. Dept. C.
1850 Colorado St. Pasadena 8, Calif.

FORMING WITHOUT DIES

with DI-ACRO BENDER

Many small parts can be rapidly formed without dies, to accuracy of .001" with DI-ACRO "Die-Less Duplicating" Machines, — Benders, Brakes, Shears, Rod Parters, Notchers, Punches. Save die expense and time delay. For experimental work, samples, models, etc., as well as regular production runs. Write for "Die-Less Duplicating" circular.

O'NEIL-IRWIN MFG. CO. 342 8th Ave., Lake City, Minn.



MODEL SHIP & YACHT FITTINGS

CARVED-HULL Construction Sets for brigs, schooners, clippers, trawler, frigates, barque, destroyer, all popular models. Since 1925 we have manufactured the largest and finest line of model fittings for above ships, also fittings for model racing yachts.

Send 25c today for Illustrated Catalog No. 24 Now Available.

A. J. FISHER
1002-PS Etowah Ave. Royal Oak, Mich.



WOODWORKERS... Get this CONSTANTINE MASTER MANUAL

Get the Most Fun From Your Hobby Indispensable to woodworkers. Newest, biggest edition, more pages, more color, helpful how-to-do-it articles, pre-war and new items, more bargains. Send 25c today and we will include **FREE! FULL YRS. SUBSCRIPTION** to Chips and Chats, published bi-monthly. Keeps you up-to-date on everything in woodworking, offers big money-saving bargains. Send now.

ALBERT CONSTANTINE & SON, Inc.
793-K East 135th Street, New York 54, N. Y.



TRI-STATE COLLEGE

**B. S.
DEGREE IN
27 MONTHS**
66th Year.
Students from all over the world.

ENGINEERING—Courses in Civil, Electrical, Mechanical, Chemical, Aeronautical and Radio (including Television). Also Bus. Admin., Acc't. and Sec. Science. Low living costs. College cafeteria on campus. Graduates in demand. Enter March, June, Sept., Jan. Write for Catalog.
539 College Avenue, Angola, Indiana.

Now! THE FAMOUS SAFETY-FILL NOZZLE WITH AUTOMATIC "HOLD-OPEN" CONTROL!



SERVICE STATION OPERATORS

... It's like having an extra helper! Fully automatic ... nothing like it ever before!

No need to stand and hold the nozzle ... just start it running ... the safety catch-ring holds it securely in position ... the hold-open control clicks automatically into place the instant you press the nozzle lever ... keeps the gas flowing at any selected speed.

When the tank is full, Safety-Fill cuts off automatically ... no spilling, no waste. And, while the tank is filling, the attendant is free to perform other services, clean the windshield, check the oil, tires or battery.

Safety-Fill nozzles, with the automatic hold-open control, will increase sales because attendant is free to give better service and more attention to the customer. Capitalize on this extra time to push other products, perform other services ... obtain more sales and more profits.

MAIL YOUR ORDER TODAY!

Specify Model B-820-L, complete with "Safety-Latch" control. Price, \$18.19 each, prepaid nearest R.R. station in U. S. Send \$3.00 for each nozzle ordered. Balance C.O.D.

RICHMOND OIL EQUIPMENT CO., INC.
1419-21-23 E. Main Street Richmond 19, Va.

BLISS Electrical Training

Intensive 32 weeks' residence course in fundamentals of **industrial electrical engineering**, including radio and electronics. Extensive laboratory, shop work, drafting. Prepares for electrical technician and engineering aides

in communications, power, manufacturing, business machines, sales, service. 56th year. Classes begin April 4, Sept. 6. Catalog. 7604 TAKOMA AVENUE, WASHINGTON 12, D. C.

LEARN MEAT CUTTING EASILY - QUICKLY At Home-In Spare Time



The steady, dependable trade of Meat Cutting taught easily, quickly by improved HOME METHOD. National School, established over 25 years, has organized its famous "Learn By Doing" Classroom, Cutting room and Retail Market training system into sound, practical HOME STUDY form.

Now, by the miracle of this EXTENSION TRAINING you can prepare in Your Spare Time At Home, for a better job, bigger responsibilities or success and security in a store of your own. Remember, PEOPLE MUST EAT!

Buying, cutting, percentage, pricing, advertising, selling—a complete meat education. For beginner or men with ex-

perience. Thousands of successful graduates. Send coupon for FREE Bulletin NOW!

MAIL THIS COUPON TODAY FOR FREE BULLETIN

National School of Meat Cutting Div. O-76, Toledo 4, Ohio

Send me your FREE Bulletin on Meat Cutting and Meat Merchandising. No obligation. No Salesman will call.

Name

Street

City State

Plastic Coasters
and Tiles

EMBED REAL FLOWERS in NEW Magic PLASTIC



Now, create many unusual things like the distinctive pansy coaster shown—made by embedding real pansies in Castolite—the "magic" liquid plastic that "pours cold like honey... sets like glass"... at room temperature. Comes crystal clear or may be dyed for brilliant color effects. Embed other flowers, too, also coins, butterflies, medals, etc. Make really different jewelry, candlesticks, picture frames for gifts or to sell.



POUR GORGEOUS BOOKENDS

Castolite makes it easy to cast exquisite bookends like the one shown. Make duplicates of hundreds of art objects, figurines, etc. No special artistic ability needed. With new, easy-to-use Castomold you make your own molds in minutes. Use only home utensils. Follow simple step-by-step method. New pleasure, fine profits are possible.

EMBED YOUR PHOTOS

Preserve treasured photos in Castolite. Make beautiful medallions like the one shown, unusual photo lampshades, lamp bases, paper-weights with embedded photos. Send 25c for new Instruction Manual, packed with pictures showing how to get started. Write today.

The Castolite Co.
Dept. C-4, Box 391
Woodstock, Illinois



Accept 1-Volume Science Encyclopedia on 7-Day Trial

● All the latest wonder-lore of science at your fingertips in one giant volume! Big 256-page book, packed with over 4000 facts, yours on 7-day trial! Send \$2.49 to Popular Science, Dept. 39, 353 4th Ave., New York 10, N. Y.

AMAZING NEW SAFE JIG SAW READY!

At last—a revolutionary, new electric jig saw small children may use, yet powerful enough to be the basic tool in Dad's workshop! Make "Standing Photo Silhouettes" of favorite snap shots... fancy what-nots, toys, for fun and profit! Just plug in and saw! No motor to buy, no oiling. Thousands sold. Use in living-room, apartments, etc. Patented. Nothing else like it. Mail postal NOW for illustrated, Free Circular, low price! (Dealers write!)



FREE
Circular!

SYNCR

SYNCR CORPORATION, Dept. M-39, Rochester, Mich.

BE A NOTARY PUBLIC

For effortless lifetime income. You notarize only legal papers with your signature and official seal, as a public notary, collect and keep the fees. No training needed, no course to study. Like compound interest, money intake grows as your official capacity becomes known. Income modest but steady, never-ending, like paid-up annuity. If you qualify as to character and age, old legal-supply firm, 22 cities, will see you appointed by governor and equip you for \$25. Every business person, steno, accountant should be a notary. Apply...

STATIONERS EXCHANGE

Boerne 23, Texas

REAL ESTATE BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! No obligation. Graduates report making substantial incomes. Start and run your own business quickly. Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. STUDY AT HOME or in our classrooms in big cities. Diploma awarded. G.I. approved. Nationally known.

WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
15 E. Pershing Road Dept. NT-1 Kansas City, Mo.

FREE
BOOK
TELLS
HOW

4 SPEED MOTOR WITH 1000 USES!



The built in integral gear box has four 1/4" drive shafts turning simultaneously at the following speeds:

- 4000 RPM for grinders, buffers, small drills, flex shaft tools, etc.
- 150 RPM for wrapping fishing rods, driving pumps, slow speed tools, fans.
- 25 RPM—rocker for photo developing tray, cabinet makers glue wheel, erector sets, film puller for 16 mm, developer, operating laboratory equipment, etc.
- 5 RPM for turning barbecue spits, advertising displays and antennas.

A THOUSAND OTHER USES AROUND THE WORKSHOP

This 1/20th HP, 115 V., 50/60 cycle, AC motor is precision built throughout.

Fully guaranteed—Money refunded if not satisfied

Pulleys, belts, shaft couplings, Mandrels and other equipment at 15c to 60c. List sent with motors. SPECIAL—while they last.....

Californians please add 22c sales tax

- For amateur beam & television antenna
- Drives working models, toys and gadgets
- For action displays, miniature fountains
- For doctors, dentists, jewelers, technicians



\$9.95

SENT
POSTPAID

TROUP ENGINEERING CO., 2223-A Grand Ave., Long Beach, Calif.

MAKE ANY CUT WITH THESE NEW WOODSHAPERS for YOUR CIRCLE SAW or DRILL PRESS!



MODEL #60—Originally designed for heavy industrial use, now priced for home workshop. Can be attached directly in chuck of your drill press. Exclusive pilot bearing (see illustration) eliminates side thrust, chatter and vibration—assures smooth cutting action. Blades can't come out—set screws hold them securely. Complete, with YOUR CHOICE OF ANY 6 PAIR DOUBLE-GROUND BLADES SHOWN BELOW, only \$12.95.

MODEL #50—Same as Model #60 but without exclusive pilot bearing. Designed for intermittent shaping; over 100 different shapes can be cut. Complete, with ANY 6 BLADES OF YOUR CHOICE SHOWN BELOW, only \$8.95. All Aladdin tools are guaranteed. Postage prepaid with all cash orders. C. O. D. plus postage. GET YOUR ORDER IN TODAY.

ALADDIN TOOL COMPANY

3121 Main Street

Kansas City, Missouri

Dealers Write Today

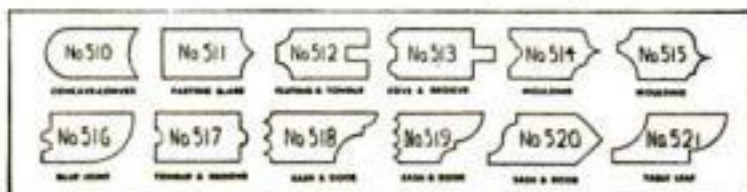


For Your Circle Saw

through. In ordering, state diameter of shaft. Complete WITH ANY 6 PAIR OF READY-GROUND BLADES SHOWN BELOW, only \$14.95.

ALADDIN WOODSHAPING BLADES

Specify by number the blades you want. Additional blades \$1.50 each. \$3.00 per set.





GET INTO DRAFTING

The Draftsman Plays a most Important Part in INDUSTRY

DRAWING OUTFIT INCLUDED with Drafting courses.

All the tools you need including folding drawing table. With them you can put your ideas on paper quickly and with accuracy. With training you are all set to master Drafting in months, —not years—at home.

Learn in Spare Time—At Home! (or at the College in Chicago)

A few hours of pleasant home study every week—that's all. With Chicago Tech's help, you train yourself step by step. This tested method—developed over 45 years of C.T.C. progress—prepares men for good positions in industry.



CHICAGO TECHNICAL COLLEGE

C-226 Tech Building, 2000 South Michigan Ave.
Chicago 16, Illinois

Practically everything that's built or manufactured these days is constructed from blue print drawings prepared by the draftsman. He is the KEY man in industry. No new machines can be built, no bridges erected, no buildings constructed until the draftsman has completed his work.

Drafting is clean, interesting, professional-type work. The draftsman is paid well to start. And he has real opportunities for advancement to high-pay jobs in Engineering. The tremendous production programs ahead in industry will require more draftsmen than ever before.

Send today for free information. See what this training has done for others, what it can do for you. Simply MAIL COUPON TODAY in an envelope or use a penny postcard.

MAIL COUPON NOW

CHICAGO TECHNICAL COLLEGE

C-226 Tech Bldg., 2000 So. Michigan Ave., Chicago 16, Ill.
Mail me FREE Drafting Lesson with information about big opportunities in DRAFTING and how I can train at home.

- ☐ Architectural Drafting ☐ Electrical Drafting
☐ Machine Drafting ☐ Structural Drafting
☐ Builders' Course

Name.....Age.....

Address.....

City.....Zone...State.....

DIRECT FROM MANUFACTURER AT LOW PRICES

Make Money—Sell Them to Your Friends • Dandy for Gifts and Prizes



Ball Pen and
Lighter. Writes
and Lights.
SPECIAL
PRICE \$9
DOZEN.
SAMPLE \$1.

Regular Size
Double end
Ball Pen.
Writes 2 col-
ors. Red, Blue.
\$8 DOZ. SAM-
PLE PEN \$1.

Regular Pock-
et Size BALL
PEN \$6 DOZ.
Smooth, long
time writing. 2
SAMPLES \$1.

Jeweled Fill-
gree Ball Pen
& Key Chain.
Gold Finish.
OUR PRICE
\$6 DOZ. 2
SAMPLES \$1.

Purse Size
Midget Ball
Pen with Key
Chain. OUR
LOW PRICE
\$1 DOZ. 3
SAMPLES \$1.

Ball Pen and
Mechanical
Pencil Set.
SPECIAL
PRICE \$12
DOZ. SAM-
PLE \$1.50.

Refills for all Pens \$2 doz. No C.O.D.'s on Samples. 25% deposit on all orders.
Address Dept. 5—POST PAID IF MONEY INCLUDED WITH ORDER

JEROME PEN CO. 306 BOWERY NEW YORK 12, N.Y.

BURN WATER IN YOUR CAR!

The new OCTA-GANE Water Injector is designed to give your car premium performance from low grade fuels. In addition it will measurably increase power and mileage completely eliminate engine "ping" or "knock", and keep your engine internally clean.

The OCTA-GANE is a well constructed unit, engineered to last for the life of your car. It comes complete with a stainless steel tank and all necessary fittings and brackets for mounting. Installation is a simple matter of a few minutes. A one year guarantee comes with each OCTA-GANE.

The OCTA-GANE is priced at only \$24.95 delivered and we urge you to take advantage of the special coupon at right to give your car a new lease on life.

We will be pleased to send you full descriptive literature at your request.



COMMONWEALTH CARBURETOR CORP.
SUCCESSORS TO CONTINENTAL CARBURETION CO
DIV. 15-A, 1478 UNIVERSITY AVENUE, BERKELEY, CAL.
Inquiries invited from established automotive dealers.

COMMONWEALTH CARBURETOR CORP.

DIV. 15-A, 1478 UNIVERSITY AVENUE, BERKELEY, CAL.

SIR: PLEASE SHIP TO ME IMMEDIATELY ONE COMPLETE OCTA-GANE WATER INJECTOR UNDER THE PLAN CHECKED BELOW

- ☐ \$1.00 ENCLOSED, PAY POSTMAN BALANCE C.O.D.
☐ \$24.95 ENCLOSED, SHIP FULLY PREPAID.

(PLEASE PRINT PLAINLY)

NAME: _____

STREET: _____

CITY: _____ STATE: _____

MAKE & YEAR OF CAR: _____

MODEL: _____ NUMBER OF CYLINDERS: _____

How to Write

Short Stories, Mysteries, Articles



Keith Monroe

FREE Lesson Shows How You Learn at Home for Part- or Full-Time Career

HAVE you ever had an urge to write? Have you or friends had interesting experiences or ideas about people, places, hobbies, sports, business or social activities, that might make interesting stories or articles for general magazines, trade and technical journals, fraternal publications, etc.?

Editors agree: the demand for new writers is greater than ever, and you don't have to be a genius to make money. Many Palmer beginners earn while learning, receiving small but welcome checks for material that may be turned out quickly once you acquire the technique. And now it's easier to learn than you may imagine, through Palmer's unique method of training—for not just one field of writing, but for all: Fiction, Article, Radio. Endorsed by famous authors—including Rupert Hughes, Gertrude Atherton, Katharine Newlin Burt, A. E. Van Vogt, and by hundreds of successful graduates.

Now Sells to Big Magazines

"Since studying the Palmer course, I've been able to sell to *The Post*, *Life*, *American*, *Esquire*, *Reader's Digest*, and other top magazines. It's the finest course anywhere."—Keith Monroe, Santa Monica, Calif.

You get practical writing assignments to do at home. Your work is individually handled by professional writers. Study fast or slow. Save time and effort. To find out how you too may make money writing, send for free illustrated book, "The Art of Writing Salable Stories," plus free sample lesson and typical writing assignment. Palmer Institute of Authorship (Est. 1917), Desk U-39, 1680 N. Sycamore, Hollywood 28, Calif. Send today.

**APPROVED
FOR
VETERANS**

FREE LESSON

**Palmer Institute of Authorship, Desk U-39
1680 N. Sycamore Hollywood 28, Calif.**

Please send me free sample lesson and illustrated book explaining how your home-study training helps new writers get started. This is confidential. No salesman will call.

Mr.
Mrs.
Miss

Address

City

Zone State

Veterans: ☐ Check here if eligible under the G. I. Bill.

Sensational New Electric

① WELDER ② CUTTER!



#1 WELDER



#2 CUTTER

USES 110-115
AC or DC
WELD-BRAZE-
CUT-SOLDER-

MELT-HEAT TREAT
INSTRUCTIONS INCLUDED

The WELDRITE combination—tested and proven by countless commercial and amateur users, is now offered direct to you at the amazingly low price of only \$15.00. No Gas—No plug WELDRITE into 110-115 AC or DC outlet. Uses standard welding and brazing materials available at all welding supply stores. WELDRITE furnished complete with Converter Unit, #1 Single Holder with attached Alligator clip, for welding metal up to 3/16" thickness, using up to 3/32" rod, and #2 Double Holder with Copper Coated Dual Carbon Electrodes for Cutting, Brazing, Melting, Heat Treating, Soldering, etc. Starting welding materials and instructions included. Ideal for home workshop, invaluable for body and fender shops, garages, repair and machine shops, manufacturers, etc.

SEND NO MONEY! 10 DAY TRIAL OFFER. Order your WELDRITE Electric WELDER-CUTTER C. O. D. today. Pay postman \$15 plus postage charges (wt. 5 lbs.) or send \$15 and we will pay postage. Either way, if not satisfied, return WELDRITE in 10 days, and money will be refunded. **WELDER HOOD**—Approved lens found in hoods costing to \$10—only \$3.95. **Free Folder on Request.** California order please add 2 1/2% sales tax.

CALIFORNIA TECHNICAL PRODUCTS CO. 448 So. Hill St., Dept. B-3 Los Angeles 13, Calif.

WELDER HOOD
With Wilson Weld Lens No. 10, approved by American Optical Company. Used in Hoods costing to \$10, only \$3.95

**BOTH only
\$15**

Do it
Faster
and
Easier
with
the

WRITE FOR FREE CATALOG — shows attachments that save time and money!



PAGE Garden Tractor

New 1949 line with extra features! Riding and walking models, 1 1/2 to 5 HP. Complete gear drive, no cheap belts or chains. Large tires—high clearance—easy to handle—power turn. Low factory prices—\$188 to \$436 with cultivator. Get benefits of 24 years of garden tractor experience!

PAGE DAIRY and FARM EQUIPMENT
1916 S. 81st STREET • MILWAUKEE 14, WIS.

INVENT and GROW RICH



Is a new, instructive, stimulating book that tells—**HOW TO**—Develop Inventive Ability, Find Ideas To Patent, Sell, Protect, Finance, Mfg., Market, Make Money and Succeed With Inventions, Gadgets, Where, How To Advertise Patents for sale, made on royalty; other valuable information. **INVENT-GROW RICH** is helpful guide to inventive success. A "must" for beginner—important data for experienced. Increase your inventive ability—profit from those ideas through a copy for only \$2.95 post-paid, C.O.D. or at your dealer. Satisfaction Guaranteed. Free circular. **WETZEL PUBLISHING CO., INC., 524 S. Spring St. D, Los Angeles, Calif. Limited Gift:** A four months' subscription to new *Inventor and Gadgeteer Magazine* with each book order.

LEARN IN SPARE TIME— by Easy PICTURE CARTOONING CHART METHOD!

Same Simplified Method that has helped train creators of "Steve Canyon," "Winnie Winkle," "Out Our Way," "Secret Agent X-9," "The Neighbors," "Regular Fellers," "Strange As It Seems," and many others. Send for descriptive literature, and full details. (Please state age.)

LONDON SCHOOL OF CARTOONING
4923 Cleve. Transit Bldg., Cleveland 14, Ohio



NEW!



DO IT AT HOME

FOR PROFIT & PLEASURE

IN COPPER TOOLING & ETCHING

No Experience needed—start at once. **BIG MONEY** waiting in **COPPER ART** field. Plaques, Bowls, Trays, Gifts, Souvenirs of all kinds. Start on the road to success NOW! Here is an opportunity to get started in your own Big Paying Business—**FREE DETAILS** don't wait—**WRITE NOW!**

HOLLYWOOD COPPER ART—Dept. PS-3
7266 Sunset Blvd., Hollywood 46, Calif.



CIGARETTES

SAVE MONEY—BUY CARTONS

Add 2¢ per carton 150 to 500 miles
Add 3¢ per carton 500 to 1000 miles
Add 4¢ per carton beyond 1000 miles
Minimum order — 5 cartons. No C.O.D.'s.

REX PRODUCTS DEPT. 8
434 North Gay Street, Baltimore 2, Md.

\$1.47

Postage Prepaid
within 150 miles

Tells How You Can Learn to

FREE BOOK MOUNT BIRDS!

Learn At Home

Men, Boys, Hunters, Fishermen, mount and save your lovely wild-game trophies. Be a Taxidermist. Mount Birds, Animals, Heads, Fish, Tan skins. YOU learn easily, quickly in spare time. Have a grand home-museum. The finest and the greatest hobby known, for sportsmen. Fun, real profits.

FREE BOOK

Yes, FREE. Beautiful strange, valuable Book, telling all about Taxidermy. Contains over 100 beautiful game-pictures. And it's yours FREE, if you rush your request. You can mount all kinds of wild-game, and common specimens too. We can positively TEACH YOU. So GRASP this opportunity. RUSH letter or postal for this amazing FREE BOOK. Don't delay. State your AGE. N. W. SCHOOL OF TAXIDERMY, 2603 Elwood B-dg., Omaha 2, Neb.

LEARN EXPORT

Buy and sell world-wide without capital. Travel abroad if desired. Export men and women in demand. Your own business — profits unlimited. Salaried jobs in many branches of Export-Import. Practical, low cost WORLD TRADE COURSE teaches you quickly at home in spare time. No previous special experience or schooling needed. World Trade Certificate awarded. Write today for FREE BOOKLET. No obligation. State if veteran. Air-mail reaches us overnight. THE MELLINGER CO., Exporters-Importers, 1422 E O Westwood, Los Angeles 24, Calif.

MASTER COURSE IN HYPNOTISM

SECRETS REVEALED
Actual methods, techniques of master hypnotists... how to hypnotize suitable subjects at a glance—a command—by phone! How to control subjects after they awaken—help break tobacco habit, etc. Self-hypnosis. Group hypnosis. Entertain with amazing hypnotic stunts for fun or profit. Get this step-by-step, easy-to-understand course now. **SATISFACTION GUARANTEED.**
Photo-illustrated complete \$2.
Instructive folio "How to Develop an Alarm-Clock Mind" included while supply lasts. Order "Hypnotism Course" today!
POWER PUBLISHERS, M. O. Dept., 790 Broad St., Newark, N. J.

STANDARD GARDEN AND SMALL FARM TRACTORS

Plow Seed Cultivate Mow Hay and Lawns
Powerful Gas Tractors for Small Farms, Gardeners, Florists, Nurseries, Fruit Growers, Poultrymen.
1 & 2 Cylinders
High Wheels. Rubber or Steel Tires. Walk or Ride.
Do Belt Work — **Free Catalog**
STANDARD ENGINE CO.
MINNEAPOLIS, MINN. NEW YORK, N. Y.
4041 Como Avenue 681 West 26th Street

Save On CIGARETTES

All Popular Brands \$1.57 Carton!

We pay all postage and insurance on 5 cartons or more to any point in the U. S. Add 5c per carton on less than 5 cartons. Send Remittance with Order.

SIDNEY SMITH, INC.

BOX 1025 — DEPT. POS-3 JOPLIN, MO.

BUILD THIS CONCRETE BLOCK MACHINE

Sell blocks; or build your home, garage, barn, or filling station at 1/3 cost by making and laying your own blocks.
This simple machine which you can build yourself at a cost of \$15 (excluding motor) will make a block in 30 seconds using only one form. Mass production can be achieved by a new simple method of removing blocks which allows two to four forms to one vibrator. Power driven concrete mixer plans also. Send dime for details and "How to Make and Lay Blocks" folder.

U-BUILD-IT SERVICE

Dept. S-5, 206 West Wilder Ave., Tampa 3, Fla.

BIG PROFIT PLAN YOUR FUTURE



Permanently Metalized Baby Shoes
START YOUR OWN BUSINESS

AT HOME • SPARE TIME • FULL TIME



Now is the time to cash in on this big-paying, easy-to-operate, year-round business and you need no experience. MATERIALS COST YOU ONLY 5c—YOU GET \$6.00! With actual illustrations and step-by-step instructions. YOU can start earning money in only one week—up to \$50 to \$75 per week spare time—up to \$1000 per month full time—\$5.00 and more per hour possible. Working only a few hours you can make more money than most people make working an entire week.

IMMEDIATE RESULTS—This tested and proved method shows you complete details so that you may start at once metallizing baby shoes with real Gold, Silver, Bronze, Pearl and Glass. They will last for ever and ever retaining

- Money-Back Guarantee
- Most Successful Name in Metallizing
- Big Income
- Huge Demand
- Sales Plans
- Future Security
- Your Own Business

every priceless detail of natural shoes. Five million new customers waiting to buy every year.

BEGIN AT HOME—Don't pass up this golden opportunity to start your own business on a shoe string. ACT NOW! We will send you full details absolutely free

LARGEST NUMBER OF SUCCESSFUL BUSINESS MEN

Our course has the largest number of successful business men in this field today. All are men and women who acted and are making money. THIS COURSE IS GUARANTEED.

FREE!



Course includes FREE—2 actual metallized baby shoes guaranteed most attractive on market or PAIR OF YOUR OWN baby shoes metallized if you prefer

USE THIS COUPON
SEND NO MONEY
KIKTAVI
Company, Dept. PS-3
2111 W Manchester
Los Angeles 44, California

Rush me FREE full particulars at once

NAME _____
ADDRESS _____
CITY _____ Zone _____ STATE _____

MARCH 1949 43



OUR GUARANTEE
Our tires must make GOOD or WE WILL
NEEDLESS TO PAY MORE
RISKY TO PAY LESS
Send this ad with order
TUBE GIVEN WITH EVERY TIRE
You Get What We Advertise
Highest Quality—Lowest Prices
Slightly Used
HIGH ORIGINAL TREADS

BUY IN CONFIDENCE safe
dependable POPULAR BRANDS
POSITIVELY NOT RE-CAPS

These are genuine Values!
One Trial will CONVINCE YOU

600-16 ..	\$4.30	700-15 ..	\$4.10
650-15 ..	4.10	700-16 ..	4.85
650-16 ..	4.30	750-16 ..	5.85

SELECTED O.K. for TOUGHEST JOBS
Not just good... THE BEST

TOPS IN VALUE		TOPS IN SAFETY	
600-16	\$5.40	700-15	\$5.40
650-15	5.00	700-16	6.40
650-16	5.40	750-16	7.00

World's Best Truck Tire Values
Top Service Minimum Prices

600-20	\$8.00	750-20(10)	10.95
650-20(6)	8.00	825-20	12.75
700-20(8)	8.95	900-20	12.75
32x6(8)	10.50	1000-20	13.75
32x6(10)	12.25	1100-20	14.75
750-20(8)	10.50	1100-22	16.75

750-20 MILITARY 8 PLY \$10.75
900-16 MILITARY 8 PLY \$7.50

ONE QUALITY THE BEST AVAILABLE

Thousands of tires shipped to satisfied customers.
We've made thousands of friends. MAIL ORDERS
given personal Attention. Send money order or check.
Dep't. 5

STANDARD
834 N. Broad St. Phila. 30. Pa.

For \$19.95! CAN'T BE BEAT!

IT
POLISHES

IT
SANDS

IT
DRILLS



COMPLETE PORTABLE WORKSHOP

CHECK THESE FEATURES!

- ★ 1 Hi-power portable 1/4" electric drill 110-volts, AC-DC, 25-60 cycle, universal motor, Cutler-Hammer trigger switch and Jacobs chuck, net weight 3 1/2 lbs., factory guaranteed.
- ★ 13 twist drills, sizes 1/16" to 1/4" by 64ths, "mirror finish" with metal gauge stand.
- ★ 10 sanding discs of assorted grits for sanding.
- ★ 1 genuine sheepskin bonnet for polishing.
- ★ 1 flexible rubber adapter with 1/4" shaft that fits into chuck of electric drill.
- ★ 1 sturdy all-steel carrying case with steel-formed handle; fits the hand.

Order now! We pay all mailing charges with money order or check. Postage extra with C.O.D.

LASALLE MACHINERY COMPANY
4430 Woodward Avenue, Dept. PS, Detroit 1, Michigan



Handy Flexible SHAFT

Converts any motor, drill press, electric drill, electric fan (10 inch or larger) into a handy rotary tool

Attach ROTA-SHAFT in a jiffy. Use for grinding, polishing, sharpening, cleaning, engraving, making tools, carving on metal, plastic, wood, glass. Convenient handpiece for easy handling... 40-inch overall length. Complete with buff and sanding disc ready to use in a drill press chuck. Order today!

ONLY
\$2.95

OLD FAN MOTOR



VACUUM CLEANER MOTOR



SEND NO MONEY! Mail your order. Pay postman only \$2.95 plus postage on delivery. Try 10 days—if not delighted, return for money-back. For use on motor, add 35c for Special Coupling and state shaft diameter.

STRADER PRODUCTS CO.

DEPT. H-102

259 Strader Ave.

Cincinnati 26, Ohio

TableTop MODEL RAILROAD!



SWITCH ENGINE KIT.....\$22.00
BOX CAR AND CATALOG.....\$1.60

Ask your Hobby dealer to order for you or send direct. New 1949 catalog 20c.

Have fun building and operating America's smallest railroad models. Accurately scaled 10 ft.=1 inch. Track (TT gauge) only 15/32" wide. You can hold a "big" locomotive in the palm of your hand... have track, switches galore without crowding. Ideal for a card table or desk-top layout. Build engines and cars from kits or buy ready-to-run. Streamliners, Diesels, Steam Locos, Freight and Passenger Cars.

COMPLETE TRAIN SET KIT WITH ENGINE, 3 CARS, AND 10 1/2 FT. TRACK.....\$29.95

H. P. PRODUCTS CO., Hartford City, Indiana

BE AN ARTIST

Send for interesting picture book "BUILDING A FUTURE"

Explains the unique position of the professional artist in American life. Gives examples of huge professional income. Tells definitely how YOU can acquire PROFESSIONAL skill—AND PROFESSIONAL INCOME—within one year—in spare time at home. No obligation. Book is free. Write name, address and age on penny postcard and mail TODAY to:

GRANT SCHOOL OF ART

Dept. 23, 225 North Michigan, Chicago 1, Ill.

SPEED ALL PURPOSE HANDLE
TOOL OF 101 USES!



Holds files, razor blades, taps, drills, allen wrenches, bits, any shape shank, flat, oval or round. Operates similar to a drill chuck. Precision made. The handiest tool in your tool box.

ORDER NOW!... **\$1.00** Post Paid

SPEEDCOR PRODUCTS
2025 N E Sandy, Portland 12, Ore.

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH

Registered Patent Attorney

205 Columbian Building

Washington 1, D. C.

YOUR GUIDE TO A SUCCESSFUL FUTURE

Auto Mechanics

Body-Fender

Diesel Mechanics

Drafting

Learn A Trade

Radio-Television

Refrigeration

Electricity-Electronics

Building Trades

Earn More Money



The years ahead are going to be big. Grow with them. Prepare now to get into a great, growing industry. Train with C.T.I.—a Nationally Known School. Get the benefits of our efficient Placement Service whether you want

a better job or business of your own. You can come directly to our big, well equipped shops, located only a block from the shores of Lake Michigan—or you can begin your training at home by C.T.I.'s SHOP-PROVED HOME TRAINING METHODS. Fill out coupon—mail it today for big, illustrated FREE booklet.

VETERANS—Just mail coupon, we will handle all details.

NON-VETERANS—Don't let the lack of ready cash prevent you from taking this training now. Investigate our Low Easy-Payment Plan and our Pay-After-Graduation Plan.

FILL OUT · CUT OUT · MAIL TODAY!

FACTS FREE FOR MEN WHO WANT TO GET AHEAD

COMMERCIAL TRADES INSTITUTE, Dept. E1-3
1400 Greenleaf Ave., Chicago 26, Ill.

Send free illustrated Brochures and other information about the field I have checked below.

☐ Body & Fender Repairing
☐ Automotive Mechanics
☐ Diesel Mechanics

☐ Radio
☐ Television
☐ Electricity

☐ Building
☐ Drafting
☐ Refrigeration and Air Conditioning

Name _____

Address _____

City _____

State _____

☐ Veteran

☐ Non-Veteran

\$64.40 PROFIT IN 4 HOURS

That's Pollack's FIRST DAY Record with ROTO-CLEAN—Amazing New Non-Electric Whirling Glass Cleaner

I've been in Direct Selling a long time. In my day, I've run across some terrific moneymakers. But believe me, for quick and spectacular and steady profits, I've never seen the equal of ROTO-CLEAN! Pollack worked just 4 Hours and made \$64.40 profit for himself. ROTO-CLEAN is the non-electric glass cleaner that works on an amazing new principle. Just press a glass over the brush and it **WHIRLS!** Bartenders, tavern owners, soda fountain and restaurant operators grab on sight. Because ROTO-CLEAN actually cleans glasses cleaner—cleans them **quicker** and **easier** than many electric glass cleaners costing ten times as much.

FREE
Demonstrator
Offer.
Mail Coupon

I'm not trying to sell you a bill of goods. In this ad, I'm not trying to sell you **anything**. All I want you to do is let me send you the **facts** so you can see for yourself. To prove I mean business, I even send real salesmen a sample ROTO-CLEAN without a penny of cost, as explained in my Special Offer to new men.

Don't send a cent. But rush the coupon. This simple step may give you the biggest, quickest cash clean-up of your life. Mail coupon now to

L. B. Patterson,
MAXILUME CO., Dept. X-91,
125 W. Hubbard St., Chicago 10, Ill.

L. B. Patterson, Maxilume Co., Dept. X-93
125-W. Hubbard St., Chicago 10, Illinois
Rush complete information about ROTO-CLEAN and FREE SAMPLE Offer to new men.

Name

Address

City Zone ... State

WANT A GOVERNMENT JOB? START AS HIGH AS \$3,351

Many Permanent Appointments Being Made

VETERANS GET SPECIAL PREFERENCE

Many Government Jobs. City and Rural Carriers—Post-office Clerks—Liquor Inspectors—Meat Inspectors—Accountants—Stenographers—Typists—etc. Prepare now for next Examinations.

FRANKLIN INSTITUTE,
Dept. M81, Rochester 4, N. Y.
(NOT GOVERNMENT CONTROLLED)

Sirs: Rush to me, without charge, copy of 40-page book, "How to Get a U. S. Government Job," list of positions, and full particulars telling how to qualify for them.

NAME

ADDRESS VET?

MARCH 1949 45



A SENSATION with CRAFTSMEN EVERYWHERE!



THIS AMAZING, NEW,
LOW-PRICED
OSCILLATING, SANDER
AND POLISHER!

\$14⁹⁵

DU-FAST
ATTACHMENT
ONLY

CRAFTSMEN! . . . Here's the new, remarkably efficient oscillating Sander and Polisher attachment for Black & Decker Home Utility 1/4" Electric Drill.

Now, in a fraction of the time, and with far less "elbow grease", the DU-FAST SANDER AND POLISHER* gives you certain, superior finishes every time . . . plus a definite saving in time and money!

- ATTACHED AND DETACHED IN A JIFFY
- WEIGHS ONLY 5 LBS. (with drill) — ELIMINATES FATIGUE
- EASY TO USE IN CORNERS, ON OPEN STOCK, AND ON CURVED SURFACES

If you use a B & D Home Utility 1/4" drill . . . you'll want the Du-Fast Oscillating Sander and Polisher attachment. In any case, don't fail to see it and try it at any hardware dealer who carries B & D Home Utility Tools.

*PAT. APPLIED FOR

MANUFACTURED BY

DU-FAST, Inc.

32 EAST FOURTH STREET, NEW YORK 3, N. Y.

Available only at hardware dealers
carrying Black & Decker Home
Utility Tools. Stop at one today!

Put POWER behind your lawn and garden chores



CHOREMASTER

ONE WHEEL
GARDEN TRACTOR

The CHOREMASTER lightens and speeds lawn and garden tasks . . . yet this rugged unit provides auxiliary power for shop tools, pump, compressor . . . out on a job or away from electric power. Circular saw, power sprayer, cultivating tools, wagon, snow plow, riding sulky and other attachments available. Write for literature or see your dealer.

\$149.00

with
std.
clutch

\$159.00

with
Centrifugal
Clutch

Attachments extra
—Plus Freight



Special Products Division

The LODGE & SHIPLEY Co.

816-3 Evans St., Cincinnati 4, Ohio

HERE'S REAR-VIEW SAFETY with INSIDE CONTROL!



AUTO SIDE MIRRORS

- NO BLIND SPOTS
- FINGER-TIP ADJUSTMENT
- INSIDE CONTROLLED

Send Check or Money
Order Today!
No C.O.D.'s

\$7⁹⁵
Only each

A right or left view mirror that eliminates the blind spots in ordinary rear view mirror by giving you all-round vision. Two adjustments . . . horizontal (A) and vertical (B) . . . are controlled at your fingertips inside your car. Driving is safe . . . parking a pleasure . . . because you see everything behind you! And there's no bothersome stretching to annoy you . . . Saf-T-View Mirrors are at your service instantly with Finger-Tip Control to give you back view driving safety! Easy installation instructions with each mirror.

MONEY BACK GUARANTEE

- Please indicate whether you want left mirror, right mirror, or both.

AUTO SPECIALTIES—Dept PS, 150 B'way, New York 7.

BUILD YOUR OWN POWER LAWN MOWER

WHY BREAK YOUR BACK MOWING FIELD OR LAWN?

WRITE FOR
FREE
BUILDING
INSTRUCTIONS

The Rite-Way
Mower
Attachment
Ball Bearing

SAVE MONEY
SAVE TIME

Now anyone can save time and effort mowing field or lawn by building their own whirl type power mower. Build according to your own ideas and needs at small cost. Cut close to fences, walks, buildings, etc. Build in short time with parts and instructions we furnish. Save hours of time and back breaking labor. Write today for FREE information.

T & H MFG. CO., Dept. M-125
811 E. 31, Kan. City 3, Mo.



For Hard-to-Heat Rooms



Only
\$8⁹⁵

each
Postpaid

INSTALL this 7" Booster Fan in a few minutes with cutting tool furnished by us at price below. Fan throws extra heat to cold room as desired. Furnished assembled to curved mounting brim 6" x 10" for simple fastening with 2 metal screws. Quiet motor is 110 V. 60 cycle, has 4 ft. cord & plug. Fan delivers 300 cu. ft. min. Complete instructions and cutting tool furnished. See your dealer or send check or money-order today \$8.95 ea. postpaid U.S.A. or COD plus charges.

Money-Back Guarantee.

NESTER METAL PDCTS., ALBION, MICH.

"MAKES ARITHMETIC INTERESTING"

NEW ABACUS of beautiful aluminum, one of the fastest and handiest little adding machines ever invented! Guaranteed to save time and money in any business. Ideal for children to learn arithmetic like a game. It's VISUAL arithmetic, you actually see how numbers are added and subtracted. With illustrated instructions. \$3.50. Larger model: add, subtract, multiply, divide, extract square root with equal ease. With complete illustrated instructions. \$6.50. Send for FREE lesson & details. Discounts to schools.

EXCLUSIVE DEALERS WANTED

LOY'S CHINESE CALCULATOR, Dept. 92-5

1317 R.I. Ave., N.E.

Washington 18, D. C.

MAKE MONEY IN LANDSCAPING

Thorough training by Internationally known Landscape Architect to start your own business, improve your home or advance in this well paid field. Many Opportunities. Approved for Veterans. Send for FREE BOOK.



NATIONAL LANDSCAPE INSTITUTE

310 So. Robertson

Dept. PS-4

Los Angeles 36, Calif.

WHICH OF THESE *Opportunities* INTERESTS *You* MOST?

●Today, choose the job you want—and prepare for it. Or if you are already engaged in the work you like best, start training *now* for quicker promotion. Acquire the knowledge that will help you to get ahead faster, make more money and have greater security.

American School, founded in 1897 as an educational institution *not for profit*, can help you to reach your goal just as it has helped others during the past fifty-two years. Check the coupon at right, add your name and address and mail it at once. The school will send you details on its training plan and outline of study prepared by specialists. There is no charge, no obligation, so send the coupon immediately.

CHECK, CLIP AND MAIL COUPON NOW

AMERICAN SCHOOL, Dept. G346, Drexel at 58th, Chicago 37, Ill.
Without obligation, Please send FREE and postpaid, bulletin and details of the Subjects checked:

- | | | |
|--|---|--|
| <input type="checkbox"/> PLASTICS ENG'R | <input type="checkbox"/> Accounting | <input type="checkbox"/> Drafting and Design for Men and Women |
| <input type="checkbox"/> Refrigeration | <input type="checkbox"/> Electrical Engr. | <input type="checkbox"/> Radio |
| <input type="checkbox"/> Architecture and Building | <input type="checkbox"/> Electricity-Pract. | <input type="checkbox"/> High School |
| <input type="checkbox"/> Contracting | <input type="checkbox"/> Electronics, Industrial | <input type="checkbox"/> Air Conditioning |
| <input type="checkbox"/> Practical Plumbing | <input type="checkbox"/> Bookkeeping | <input type="checkbox"/> Mechanical Eng. |
| <input type="checkbox"/> Automotive Engr. | <input type="checkbox"/> Private Secretary | <input type="checkbox"/> Shop Management |
| <input type="checkbox"/> Aviation Drafting | <input type="checkbox"/> Diesel Engineering | <input type="checkbox"/> Tool Making |
| <input type="checkbox"/> Aviation | <input type="checkbox"/> Sheet Metal Pattern Drafting | <input type="checkbox"/> Better Foremanship |
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Railway Training | <input type="checkbox"/> Machine Shop Operations |

Name.....Occupation.....
Address.....Age.....
City.....State.....

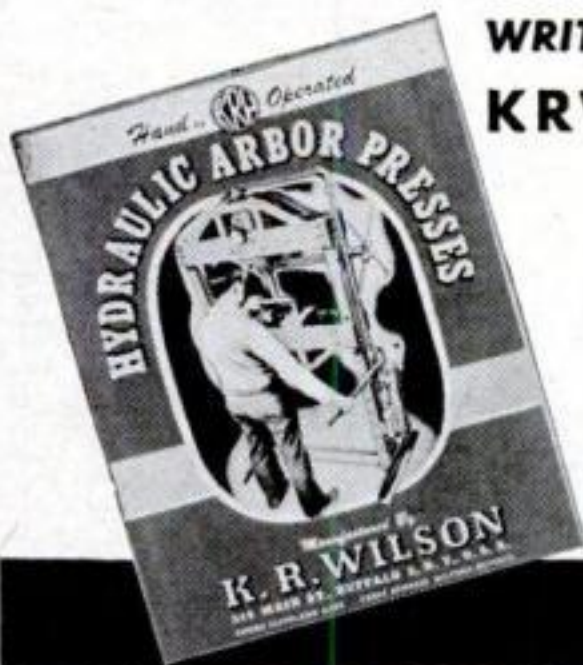
AMERICAN SCHOOL

Dept. G346. Drexel at 58th Street, Chicago 37

WRITE FOR YOUR **FREE** COPY OF THE NEW KRW HYDRAULIC PRESS BOOK

Describes all manner of Production and Shop Work on KRW Hydraulic and Bench Type Presses. 32 pages illustrating the new KRW Hand-operated, Electric-operated and Air-operated Hydraulic Presses. 25 to 100-ton capacities.

Write for your copy today.



K. R. WILSON, DEPT. 54, 215 MAIN ST., BUFFALO 3, N. Y.

NAVY STYLE FIELD SHOES

NEW. Sturdy, long-wearing, comfortable. Reverse leather upper. Oak leather inner sole. Composition outsole, rubber heel.

Sizes 7 thru 12
4.99
plus 25¢ for mailing.

SHEEPLINED FLIGHT PANTS

Reissue, excellent condition. All leather. Sizes small, med., large

3.98
PLUS 25¢ FOR MAILING

Money Back Guarantee

WAR SURPLUS VALUES

AVIATORS' JACKET

Brand new. Air Corps Type B-15. Fully alpaca lined, including sleeves. Zipper front. Large mouton fur collar. Sizes 34 thru 44.....

12.44
PLUS 25¢ FOR MAILING



NAVY JACKET

Brand new. Navy N-1 Jacket. Fully alpaca lined. Zipper and button front. Sizes 36 thru 44.....

12.44
PLUS 25¢ FOR MAILING



NATIONAL JOBBING CO.

BOX 1485 Dept. 5-3 Omaha, Nebr.

OFFICERS' PINKS

Brand new. Fine quality officers' elastic trousers. Sizes 29 thru 42. Reg. \$17.95 value.

11.50
plus 25¢ for mailing.



SHEEPLINED JACKET

Air Corps Type B-3. Like new. All leather with full sheep lining and large sheepskin collar. Zipper front. Sizes 36, 38, 40, 42. PLUS 25¢ FOR MAILING

14.95



Send for **FREE CATALOG**

Learn JEWELRY MAKING WATCHMAKING ENGRAVING

TRADES WITH
GREATER SECURITY



Above Average Pay. Trained Men Always in Demand.
Day and Night Classes. Enroll any Time. Write Today
for Free Catalog and Information.

Approved for G.I. Training

KANSAS CITY SCHOOL OF WATCHMAKING
America's Most Progressive Horological School
619 WYANDOTTE ST. KANSAS CITY 6, MO.

MAIL ORDERS NEW! Multi-Purpose Waterproof Protective Plastic Covers

Wonderful Rain Cover

100% Rain Proof—Man Size!
Fits into coat pocket easy!
Keep some in glove compartment!

- **GARMENT BAG!**
Grand for Traveling by Car!
- **BLANKET BAG!**
Moth, Dirt, Dust Proof.
Frost Cover for Plants, etc.
- **Hundreds of other uses!**

EASILY A
49c VALUE

Shipping Weight
11 ounces

8c
ea.



50" wide
54" long
Transparent
top

ARMY SURPLUS—NEW ALL PURPOSE HOUSEHOLD CLEAVERS

\$2.95 Val. Complete with Leather Sheath



Finest Quality
Cutlery Steel 11 inch Blade
Riveted Hardwood Handle.

84c

Shipping
Wt.
4 lbs.

NEW WATER PROOF CANVAS TARPS

SAVE 1/3

6x7, \$2.95
MULTI-SEAMED!
Shipping weight
7 Lbs.

9x12, \$7.56
Shipping weight
20 Lbs.

SEND FOR FREE CATALOG—AMAZING VALUES!

UNIVE-SAL ENTERPRISES

Dept. PS. 946 S. Main St.

Los Angeles 15, Calif.

Send check or money order for purchase price plus postage. 1/3 deposit on C.O.D's.

HOW TO CUT RAFTERS

New vest pocket book gives lengths, side cuts, plumb cuts, deductions. For all rafters for any building from one inch to forty feet wide. Gives numbers to cut on square. Also degrees for same cuts for Radial Saws. All standard pitches from 1/4 to 3/4. Just open book to pitch page and there are your lengths, side cuts, etc. Anyone who knows what a jack rafter is can frame a roof if he has this great book. Price \$1.50 prepaid. Over 35,000 copies sold to date.



BUILDERS' TOPICS

THE CARPENTERS' MONTHLY MAGAZINE

The he-man construction workers' magazine. The finest technical magazine published for all building trade workers. Tells you how to build—how to frame roofs—how to do electrical work—how to do plumbing, painting and plastering. Contributors to the editorials are the largest lumber, building and allied trade associations in America. If you have not subscribed, do it today. Subscription rates \$2.00 per year, or 3 years for \$5.00.

FREE

WORKERS ATTENTION! Builders' Topics is a magazine you are sure to like because it's a technical uplift—a book in itself which will come to you every month for three years for only \$5.00. For a limited time only we will give you FREE a POCKET BOOK, "HOW TO CUT RAFTERS", WITH EACH 3 year SUBSCRIPTION.

BUILDERS' TOPICS

P.O. Box 828
Seattle 11, Wash.

SAMPLE COPIES OF BUILDERS' TOPICS 25c

PLYWOOD BOAT KITS

\$54.00

(Including Freight)



This READY-CUT 12 ft. fishing boat can be assembled in 8 hrs. without forms or special tools. Kits are complete including all hardware, paint, and etc. Send for free folder.

TAFT MARINE WOODCRAFT

Dept. K 636 39th Ave. N.E.

Minneapolis 21, Minn.

DESK MODEL



EASTERN TELEPHONE CO.

TELEPHONES

\$15.95 For 2 of Either Model

Telephones are complete with power, wire, hook-up instructions etc. Any number of telephones can be connected in circuit. Common talking, common ringing. Absolutely no technical knowledge required. 25% with order, balance C.O.D., F.O.B. Brooklyn, FREE: Fine Descriptive Folder.

Dept. PS-2 320 18th St. Brooklyn, 15, N. Y.

WALL MODEL



Who Ever Heard of POWER TOOLS

Only \$8.00 Each?

Own a power workshop. Have fun. Make money. Get heavy-duty Emrick Lathe, Drill Press, Circular Saw, Grinder, Sander—all in ONE machine. Use 1/4 to 1/2 H.P. motor. Equals in performance equipment costing \$200 or more. Direct factory price \$39.95 complete. Send \$18.00 (balance c.o.d.) for 10-day FREE TRIAL. Money-back guarantee. Our fifty-first year. Write today for FREE Catalog.

EMRICK, INC., 1753 Clinton, Kalamazoo, Mich.



PROFITABLE
HOBBY

5-in-1
MACHINE



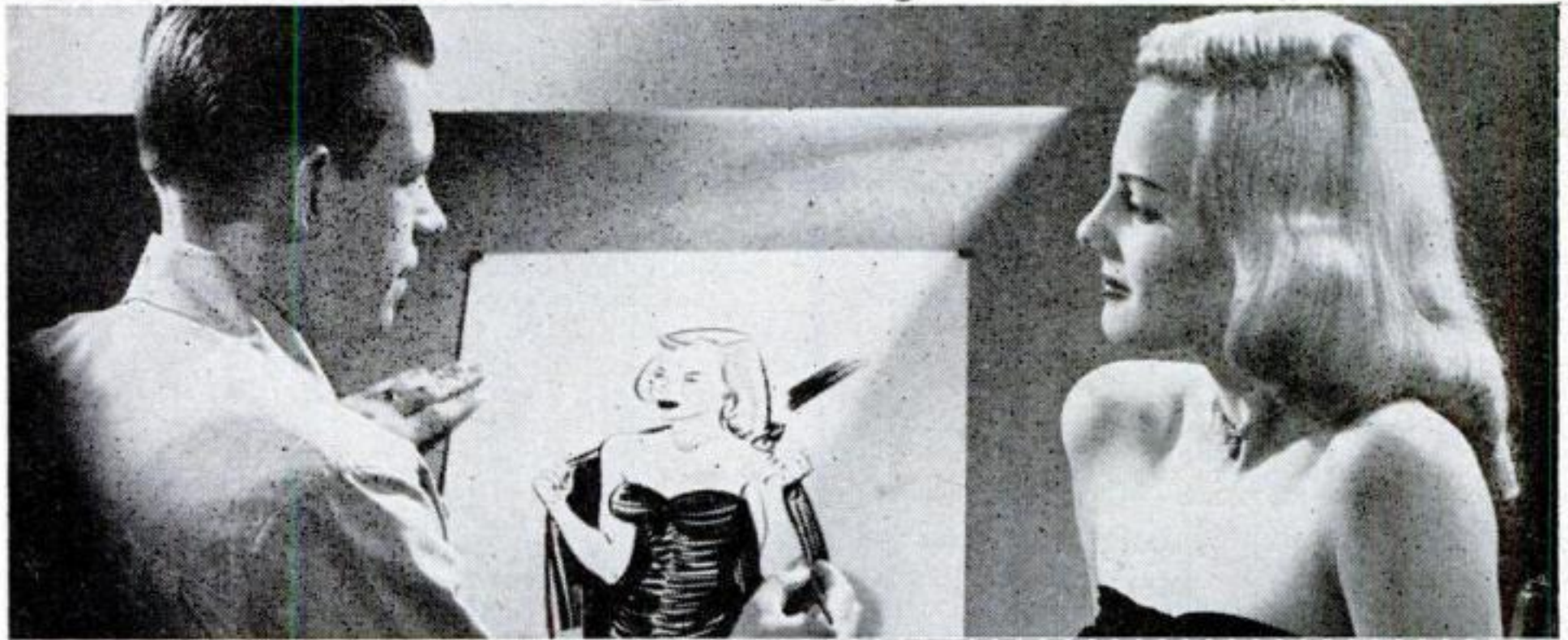
TIRES with a GENUINE MONEY BACK GUARANTEE!

You get what you order or your MONEY BACK if returned to us prepaid within 5 days! Over 1 million tires shipped from this factory all over the world.

High Original Treads, Slightly Worn, 98 % Non-Skid
6.00-16...\$5.47 4.75-19...\$5.47 Double Service
6.50-16... 5.97 5.25-18... 5.47 Premium
7.00-16... 6.47 4.50-21... 5.47 Tires \$6.27
6.50-15... 5.97 7.00-15... 6.47 8.00-16

Send Check or M.O. to Dept. B
Indiana Rubber Co., 4041 Ridge Ave., Phila. 29, Pa.

YOU are in demand if you can *DRAW!*



Make Money with Your Brush and Pen

If you like to DRAW, SKETCH, or PAINT, write for TALENT TEST. NO FEE!

ART INSTRUCTION, INC. DEPT. 3149-C, MINNEAPOLIS 15, MINN.

Please send me your FREE Talent Test

Name _____ Age _____

Address _____ Zone No. _____

City _____ County _____ State _____

INSERT
MOLLY

TURN
SCREW

FULLY
INSTALLED

REMOVE SCREW

WITH MOLLY YOU CAN FASTEN ANYTHING and do it quickly, neatly and safely. MOLLY will hold fixtures securely to floors, ceilings or any hollow wall construction... Simple to install, all you need is a screw driver. Sold by leading hardware stores everywhere.

Write for Free Descriptive Folder

PLACE FIXTURE
FIXTURE MOUNTED

MOLLY
SCREW ANCHORS

WHERE SCREWS
WON'T HOLD!
...USE MOLLYS...
FIXTURE MOUNTED

MOLLY CORPORATION

522 COURT ST.

READING, PA.

Biggest Scoop in Fluorescent!

Be First To
Take Orders For

AMAZING NEW CIRCL-ARC LAMP-S

BRAND NEW—Cash in quick and big on biggest lighting scoop in history. Beautiful new Half Circle Lamps send Fluorescent Sales to New, all-time HIGH! Nothing like them ever shown before. Old-style straight tube fluorescents can be bought anywhere, but hurry and you'll be cleaning up with WESTINGHOUSE Circl-Arc long before they reach the stores. New buyers—new profits waiting everywhere!

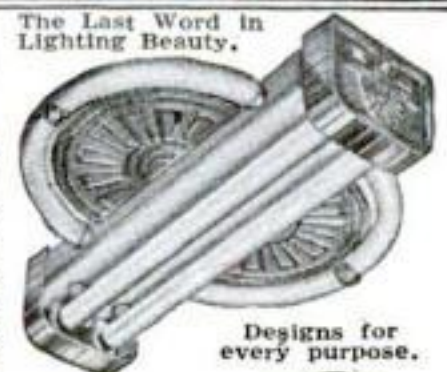
FREE SELLING OUTFIT

20 New, Modern Designs.

Send name on Penny Post Card for Complete Selling outfit. Rush name today and have record breaking profits next week.

MAXILUME CO., 125 W. Hubbard St., Dept. 93, Chicago 10, Illinois

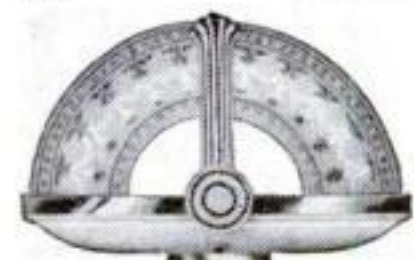
The Last Word in
Lighting Beauty.



Designs for every purpose.



Spectacular new combinations with straight tubes — or new beauty with Half Circles.



MARCH 1949 49

Learn A Trade NOW! PRACTICAL SHOP TRAINING!

In Our Chicago Shops

- | | |
|---|--|
| <input type="checkbox"/> AUTO MECHANICS | <input type="checkbox"/> WELDING—ARC and GAS |
| <input type="checkbox"/> DIESEL MECHANICS | <input type="checkbox"/> MACHINIST |
| <input type="checkbox"/> REFRIGERATION | <input type="checkbox"/> PIANO TUNING |
| <input type="checkbox"/> BODY-FENDER | |

Above Approved For G. I.'s and Civilians
One of America's Leading Practical Schools
7 Floors of Fully Equipped Shops
Over 48,000 Successful Graduates
Expert Individual Instruction
Learn by Doing—Low Living Expense
Established 1902—Day and Evening Classes

Also the following Home Study Courses

- | | | |
|----------------------------------|--|---------------------------------|
| <input type="checkbox"/> PLASTIC | <input type="checkbox"/> REFRIGERATION | <input type="checkbox"/> DIESEL |
|----------------------------------|--|---------------------------------|

—CALL IN PERSON OR MAIL THIS AD TO—

GREER SHOP TRAINING

(Desk 12) 460 South State St., Chicago 5, Ill.

Please send without obligation free information regarding trade checked above. (Specify whether you are a Veteran ☐ or Civilian ☐)

Name.....Age.....

Address.....

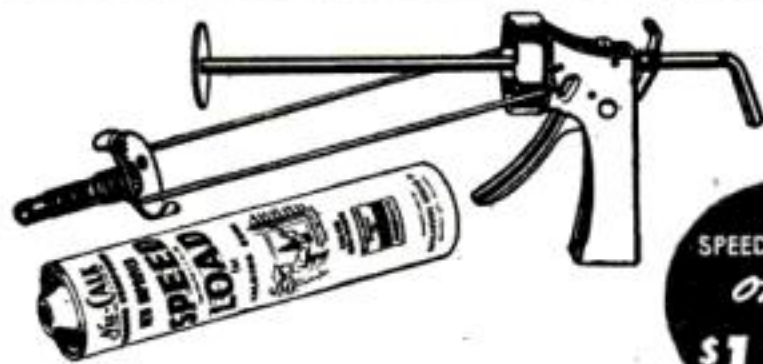
City.....State.....



DO YOUR OWN
Caliking
WITH Nu-CALK

SPEED LOAD

AND THIS NEW SPEED LOADER



SPEED LOADER
only
\$1.95

Every home should be calked and here's the combination that enables you to do the job yourself. Just snap a Nu-Calk SPEED LOAD into the SPEED LOADER Caliking Gun and you're ready to calk. You have an easy, fast, economical way to apply the world's finest calking compound.

Macklanburg-Duncan Co., Oklahoma City 1, Okla.



NO MAIL ORDERS
SOLD ONLY THROUGH LEADING
HARDWARE STORES, LUMBER YARDS
AND BUILDING SUPPLY DEALERS

EVERYTHING IN PLASTICS AT ONE PLACE!

**LARGEST SUPPLY...COMPLETE SELECTION
GREATEST VARIETY OF PLASTICS
MATERIALS,SUPPLIES,ACCESSORIES
...AVAILABLE IN ANY QUANTITY**

Casting Plastics (opaque and crystal clear). Flexible Mold Materials. Dyes, Cements (all colors). Glazes, Cleaners for plastics. Tools, including famous HOBBYPRESS for sealing and laminating plastics, wood, paper. Internal Carving Drills, Carving Blanks and Colors. Instruction Manuals, Technical Books. Plexiglas-Lucite, all colors, thicknesses. Jewelry Findings, pins, chains, clasps, etc.

Write now for FREE
1949 Catalogue

FRY PLASTICS CO.
7606 South Vermont Avenue
Los Angeles 44, California

FRY
PLASTICS CO.



**BUILD THIS
DELUXE 12-FOOT**

.....PRE-BILT BOAT

SAVE 1/2 THE COST • NO SPECIAL TOOLS

If you can use a hammer and screwdriver you can build this beautiful 12' PRE-BILT Boat for only \$89.50. All parts ready-cut from top-grade oak and marine plywood ready to assemble according to easy numbered steps. Write

BAY STATE BOAT CO.
29 Main St.
Cambridge, Mass.

for name of nearest dealer.

\$89.50

Mrs. Berry's POULTRY BOOK

FREE Gorgeous poultry book, full of pictures and illustrations. 52 purebreds and 6 Hybrids; all flocks champion-mated, licensed inspected, and B.W.D. Tested. BABY CHICKS or STARTED CHICKS, mature fowls, hatching eggs and remedies, all at **LOW PRICES**. Finest quality and best service, from THE ORIGINAL BERRY'S FARM. Large, beautiful book Free: stamps appreciated.
BERRY'S POULTRY FARM, Box 25, Clarinda, Iowa



KEEP 'EM LAFFING! Be Witty!

We put out a series of original gag sheets written by a top gag man. Perfect for speakers, salesmen, etc. and those who like to be the life of the party. Send only \$1.00 for over 500 hilarious, up-to-date wisecracks.

LAUGHS UNLIMITED
276 West 43rd St. New York City

HOTTER GAS TORCH

100% PRIMARY AIR KELLER GAS TORCH
Burns Regular House Gas (Natural Gas Only)—**\$3.45**
No Compressed Air, No adjusting Needed—Postpaid
Develops 2100 F.

Guaranteed to silver solder, light brazes, solders, removes paint rapidly. Precision-engineered. 1500 B.T.U. per hour.

Order today C.O.D. from

KELLER GAS APPLIANCES

P. O. Box 261

Monrovia, California

\$200 GROSS IN MY FIRST WEEK!



Some Make More, Some Less . . . Start This Business for YOUR OWN

Would YOU like to own a permanent, year-round business in which it is possible to take in as much as \$200 gross the first week, as did L. A. Eagles? R. E. Traynor says, "I made \$62 gross in one day." R. R. Newlin reports, "I have averaged \$173 gross per week." Others report gross from \$100 per week to \$12,000 per year.

Surely YOU will want to investigate a golden opportunity like that. You need not have any special skill or experience, but if you are ambitious, honest and courteous, we will help you to start and succeed in YOUR OWN money-making business where net profits are high.

No Shop Necessary

Our Electric Rug Washer cleans rugs and carpets like new right on the customer's floor. This quick, thorough and highly efficient method removes dirt and grime, thus restoring the natural, fresh beauty of floor coverings. Anyone can run it. Rugs and carpets are not harmed.

There are hundreds of possible customers in YOUR vicinity. Most of them have several rugs needing regular cleaning. To get a quick start,

FREE BOOK! MAIL COUPON

VON SCHRADER MFG. CO.

A393, Racine, Wis.

Send at once (no obligation) your FREE booklet containing information about your Electric Rug Washer and how I can own my own permanent, profitable business.

Name _____

Address _____

City _____ (Zone) _____ State _____

shampoo a few rugs or carpets. These customers tell their friends and soon you should have an independent, prosperous business, and you should be able to keep it growing. Send the coupon RIGHT NOW for booklet that explains everything.

Every Machine Guaranteed and Easy to Own

You take no risk. These wonderful, fully guaranteed machines have been used and endorsed by largest hotels, railroads—also used by U. S. Government. Many individuals have built up successful businesses that made big profits. Mail the coupon TODAY and we will send complete information, including how to start and succeed in YOUR business without a large investment. Don't delay your BIG opportunity. Send the coupon AT ONCE.



MAIL COUPON TO

VON SCHRADER MFG. CO., A-393, RACINE, WIS.



Success

or

Failure

WHICH?

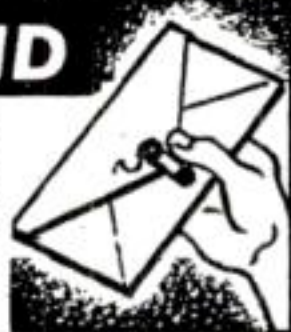
UNLEASH THE POWER OF YOUR MIND

Are YOU successful? YOU have what it takes. Many have fulfilled their desires by understanding the POWER OF THE MIND, a power many possess, but few make use of.

YOUR mind can be TRAINED to work for YOU day and night. Write for our FREE GIFT packet. Send no money—just your name and address on a post card—Do it NOW.

SELF-HELP FOUNDATION, Dept. PS-3

746 So. Lake St.
Los Angeles 5, Calif.



Complete MODEL FLYING OUTFIT! only \$6.95

Here's your chance to buy, at a ridiculously low price, a complete model plane outfit. The plane is rugged (all metal), with wings, tail & fuselage finished and colored, ready to assemble with landing gear, wheels and everything you need to fly it!



HERE IS WHAT YOU GET:

Horkner CO2 engine, ready-to-run • Prefabricated and colored plane, ready to assemble and fly • CO2 Capsule holder • CO2 Capsules for power • Correct propeller • Engine instructions • Landing gear • Flight log • Insignia • etc., etc.



Entire Outfit
\$6.95

Fly the latest in model airplanes, powered by CO2 capsules—the same capsules that charge home soda bottles. No gasoline, oil or smelly exhaust fumes. There's nothing like the thrill of CO2 flying. You don't need much space for free-flights (100 ft. square on calm days).

Order Yours TODAY! Send remittance in full or send \$1.00. We will ship same day, balance C.O.D. Large illustrated 2-color Hobby Catalog only 10¢. **AMERICA'S HOBBY CENTER Inc.** Dept. SF-39 156 West 22 Street, New York 11



Carpenters & Brick Masons

IN A FEW SHORT MONTHS IN MODERN WELL EQUIPPED

Midwest Shops

Approved for Veterans. Non-veterans may pay tuition by the month. MAIL COUPON TODAY FOR FREE INFORMATION.

Get into the billion dollar building trades. Demand widespread, check your own neighborhood for shortages of carpenters and brick masons. Our graduates are actively employed in the Building Trades, stepping directly from school into jobs or business of their own in various parts of the country. Many of our students supplement their income with part time earnings while attending school. Pleasant inexpensive living quarters in beautiful, healthful surroundings. Enroll now. Limited classes. MSBT teaches building trades only. If you prefer, you can begin your training at home.

411 N. CENTER ST. 2622-24 N. 16TH STREET
BLOOMINGTON, ILL. OMAHA, NEBR.

MIDWEST SCHOOL OF BUILDING TRADES,
Dept. PS-3,
411 N. Center Street, Bloomington, Ill.
(or) 2622-24 North 16th St., Omaha, Nebr.
(Mail coupon to Nearest School)

Please send me free information about training in the field I have checked:

☐ Carpentry

☐ Masonry

Name _____

Address _____

City _____ State _____

Are you a veteran? ☐ Yes ☐ No

WAR SURPLUS AND OTHER BARGAINS

BEARING PULLER KIT

For pushing, pulling off, or splitting any type of external or internal bearing. Adapted to fit & pull any size axle. Absolute necessity for automotive, aviation & industrial uses. Complete with instruction plate. **ONLY 37.50.** Lists for 76.00.



REGO WELDING SET

FOR ALL AROUND USE

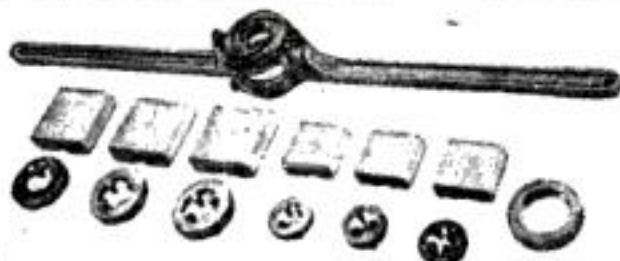
Welds, brazes, heat treats, etc. Includes guaranteed torch, 5 tips (gp42, gp18, gp54, gp62, gp70), oxygen & acetylene gauges, wrench, hose, goggles & lighter. **ONLY 54.00.** Lists for 78.00. Welding torch & five tips alone 19.75.



SEND FOR FREE BARGAIN CATALOGUE

PIPE DIE SET

Includes 6 dies, die holder and universal collar. 1/8, 1/4, 3/8, 1/2, 3/4, 1. **ONLY 14.50**

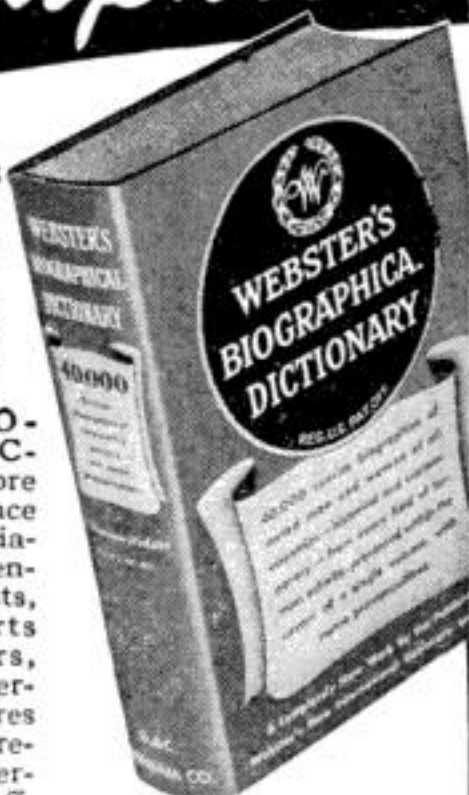


Send check or money order. 25% required on C.O.D. orders
GLENCO SUPPLY CO. Dept. P. 75-19 Myrtle Ave.
GLENDALE 27, N. Y.

ALL IN A SINGLE VOLUME! 40,000 CONCISE Biographies

... of the World's
Famous Men and Women
... from the Beginning of
History to Our Own Times...
and from Every Field of
Human Activity!

WEBSTER'S BIOGRAPHICAL DICTIONARY contains more than 40,000 ready-reference biographies, with pronunciation of names and all essential facts. Includes scientists, statesmen, rulers, sports stars, explorers, writers, painters, actors, radio personalities, eminent figures from every other field. Prepared by the famous Merriam-Webster editorial staff. A fascinating and valuable source of information for writers, speakers, and readers. 1,730 pages, thumb index. \$7.50. At your book-dealer's or from the publishers. **G. & C. MERRIAM CO.**, 205 Federal St., Springfield 2, Massachusetts.



a Merriam-Webster

Prepared by the famous editorial staff of Webster's New International Dictionary, Second Edition.

NEW ELECTRO

BAND SAW BRAZER



Brazes blades up to 1" wide. Eliminates necessity of sending blades out to be welded or repaired. Portable and light weight. Can be operated on any 60 cycle 110 V lighting circuit.

COMPLETE KIT only

\$19.75

F.O.B. Crystal Lake, Ill.

"Now you can save time and money by brazing your own band saw blades. So simple that even a beginner can make repairs superior to butt welding methods."

Brazer unit consists of high current transformer with 2 resistance electrodes arranged in a clamping device. Complete with 6 ft. cord and plug, brazing material, fluxes and instructions.

Order **THE ERWOOD COMPANY**
from . Dept. 8B, 214 Woodstock St., Crystal Lake, Ill.

3-Pc PAINT STRIPE SET Only \$1.00



3 SEPARATE TOOLS—EACH MAKES DIFFERENT WIDTH

Stripe perfect lines—straight, curved, with any paint, lacquer, enamel, easy as drawing lines with ruler! Beautify furniture, toys, autos; make signs and imitation tile. Simple instructions included.

SEND NO MONEY. Mail order. Pay postman only \$1.00 plus postage. If not delighted return in 5 days for money back. Order Now.

STRADER MFG. CO., Dept. E-352
259 Strader Ave., Cincinnati 26, Ohio

HELP FOR INVENTORS

Hundreds of manufacturers have requested our assistance in locating marketable new products.

Complete information, free.

INSTITUTE of AMERICAN INVENTORS
Dept. 3, 1926 Eye St. N.W., Washington 6, D. C.



AUTO WASHER

Your car sparkling clean—in a jiffy—magic "sponge" cleaning-cloth. Simply glide over car. **PRESTO!** Dust, grease, dirt, and grime disappear in a jiffy. Leaves finish clear, lustrous. Autos gleam like a mirror.

SAMPLES for AGENTS

Sample offer sent immediately to all who send name at once. Penny postal will do. Send no money—**JUST YOUR NAME.**
KRISTEE CO., 722 Bar St., Akron, Ohio



\$2.95 EACH

NOW! FILE YOUR OWN SAWS

Do expert saw filing at home. Precision filing easy without experience. Two simple adjustments. Keeps any hand saw extra sharp and true-cutting. Complete with file. Money back guarantee. Cash with order, prepaid. (COD postage extra.) Order today.

THE SPEED CORP., Dept. PS
2025 N. E. Sandy, Portland 12, Oregon

IMAGINE THEIR JOY when they found they could play this easy-as-ABC way!



LEARNED QUICKLY AT HOME
"I didn't dream I could actually learn to play without a teacher. Now, when I play for people they hardly believe that I learned to play so well in so short a time."
*H.C.S., Calif.



PLAYS AT DANCES
"Your lessons have been most satisfactory. I can play all of the popular songs. I have earned money playing at dances."
*E.N.J., New York.



PLAYS ON RADIO
"I can't keep from telling you that I have a good position playing from KTHS, Hot Springs, Ark., every morning."
*J.S., Okla.

What Instrument Would You Like to Play?

JUST name your instrument and we'll show you how you can learn to play it—quickly, easily, in spare time at home. Never mind if you don't know one note of music from another—don't worry about "special talent." And forget all you've ever heard about music being hard to learn.

The truth of the matter is that thousands now play who never thought they could! Yes, men and women everywhere have discovered this amazingly easy way to learn music at home. Now they are enjoying the thrilling satisfaction of playing the piano, violin, guitar, saxophone or other favorite instruments. Some of them are playing in orchestras and over the radio; others are teaching music, making money in spare or full time. And thousands are having the time of their lives playing for their own enjoyment and the entertainment of their friends.

No tedious study and practice, no tiresome exercises. You learn to play by

Easy as A-B-C

playing—start right in with the melody of a simple tune! It takes only a few minutes a day; the cost is trifling. Does it sound too good to be true? Mail the coupon and get the FREE PROOF!

SEND FOR FREE PROOF

Fascinating illustrated booklet answers all your questions; free Print and Picture Sample shows how method works. If interested, just mail coupon. U. S. School of Music, 83 Brunswick Bldg., New York 10, N. Y. 51st Successful Year.

**Actual pupils' names on request. Pictures by professional models.*

FREE! Print and Picture Sample

U. S. School of Music, 83 Brunswick Bldg., New York 10, N. Y. Please send me Free Booklet and Print and Picture Sample. I would like to play instrument checked below.

- | | | |
|--|--|--|
| <input type="checkbox"/> Piano | <input type="checkbox"/> Saxophone | <input type="checkbox"/> Modern Elementary |
| <input type="checkbox"/> Guitar | <input type="checkbox"/> Trumpet, Cornet | <input type="checkbox"/> Harmony |
| <input type="checkbox"/> Hawaiian Guitar | <input type="checkbox"/> Reed Organ | <input type="checkbox"/> Mandolin |
| <input type="checkbox"/> Violin | <input type="checkbox"/> Tenor Banjo | <input type="checkbox"/> Practical Finger |
| <input type="checkbox"/> Piano Accordion | <input type="checkbox"/> Clarinet | <input type="checkbox"/> Control |

Name _____ Have You Instrument? _____
Address _____
City _____ State _____

Save 2c—Stick Coupon on Penny Postcard

HOLLYWOOD CHROME TRIM
Running Board & Fenders! Solid Hood Panels

RAILS to doll up each side after running boards removed. SHIELDS for inside fender ends. '35-'40 Fords, '40 Mercury, '40 Chev., also most cars with slight adaptation. Complete sets \$26.00. Rails only \$12.50 pr. Shields only \$6.95 pr. Front or rear. SOLID HOOD PANELS—Ford '30-'36 \$9.95 pr., '37-\$13.95 pr. exch. Chev. '37 & '38, \$12.95 pr.

HOT ROD and RACING Equipment

Hydraulic Brake Conversion Units FORD A-B and through '38
Install Hydraulic Brake system now—Be SAFE. Complete kit includes everything needed—Cylinders, backer plates, lines, spacers, brackets, hoses, fittings, easy-to-follow instruction and etc. Easy to install in 8 hours. Money back guarantee. Order Direct and Save! Complete kits only \$75.00 F.O.B. Los Angeles. Check, Money Order, etc. 25% deposit on C.O.D. Return old backer plates collect for \$10.00 refund.

Streamline, Modernize Ford V8 & Other Cars. Lower body with our special shackles Gives car Fast, Low, Racy look—Smoother Ride. No welding or cutting. Set of 4, \$1.50 (Fords) (Specify 4" or 6" shackles and year of car). All other cars \$8.00 set. (3").

FREE—History & Catalog with order
We supply everything you need to build your own Track Cars—Hot Rods and Boats—the ideas, technical data and equipment. Start Today—Order Chrome Trim, Brakes and Shackles. RACING HISTORY and CATALOG 25c without order.

ANSEN AUTOMOTIVE ENGINEERING CORPORATION
3801 W. Jefferson - LOS ANGELES CALIF



THE WORLD'S LARGEST WATCHMAKING SCHOOL GIVES YOU:

- G.I. APPROVED, NATIONALLY ACCREDITED COURSES • MOST ABUNDANT WORKING AND TRAINING FACILITIES
- INDIVIDUAL INSTRUCTION BY EXPERIENCED FACULTY • FREE PLACEMENT SERVICE FOR PART-TIME WORK AND HOUSING DURING TRAINING • FREE EMPLOYMENT SERVICE UPON GRADUATION • COMPLETE SET OF WATCHMAKER'S TOOLS TO VETERANS • \$100 BONDED GUARANTEE OF PROFICIENCY TO PROSPECTIVE EMPLOYERS.

Send For Free 116-Page Information Packet

WESTERN PENNSYLVANIA HOROLOGICAL INSTITUTE, INC.
Write Desk 39, 808 Ridge Avenue Pittsburgh 12, Pa.

Save BUILD YOUR OWN BOAT
BIG SAVINGS AWAIT THE HOME BUILDER THRU MARINE MART'S MAIL ORDER SERVICE

World Famous "PACKAGED BOAT" Kits
18 models—outstanding design—8-18 ft.—dinghies to runabouts—Inboard—outboard—sail. \$34.50 up. Finest kits available. Easy home assembly. All parts pre-cut, frames pre-assembled. Send 25c (coin) for "Packaged Boat" literature or, send \$1.00 for literature plus booklet, "Plywood Boats."

Boat Plans—Patterns—100 Designs
100 modern designs by Deed, Lord, Crandall, etc. (6 to 35 Ft.) Planked, steel, plywood—all types—6 to 35 ft. Detailed blueprints, full size paper patterns available.
Send 35c (coin) for Catalog, or send \$1.00 for Catalog plus booklet, "Boat Building"

MARINE MART-DEPT. 23-BUFFALO 7, N. Y.

MARINE PLYWOOD
Plywood: fir, hardwood. Also boat building lumber. Stock list 10c (coin). Send 50c (coin) for stock list and booklet "Plywood Hints."

MARINE HARDWARE
Complete stock of fittings, accessories. 15,000 items. Prompt delivery. Send \$1.00 for 250-page, illustrated catalog.

CONVERSIONS
Vee- & Stern-drives; reduction & reverse gears; kits, engines, accessories. Catalog 50c (coin). With booklet, "Conversion Hints." \$1.00.

HIGH PAY JOBS FOR MEN WHO QUALIFY IN DIESEL

ASSURE YOUR FUTURE. Steady, big pay jobs await men qualified in Diesel, Tractor and Heavy Equipment. Can you take advantage of Diesel job and advancement opportunities in this fast-growing field?

COMPLETE DIESEL COURSE AVAILABLE.

If you are ambitious and want to get ahead in this lucrative field, you'll want to know about the complete training in Diesel provided by Interstate. Trains you at home in spare time. Does not interfere with your present job. Covers all phases of operation. Up to the minute. Revised regularly to cover new developments. Free placement advisory service.



YOU OWE IT TO YOURSELF

to investigate I.T.S. home Diesel training. Thousands of students agree it has helped them to better jobs... better pay. It can do the same for you!

SEND FOR FREE BOOK TODAY!

We'll gladly send you our big 24-page book "Getting Ahead In Diesel" FREE! Paste coupon on penny card and mail to

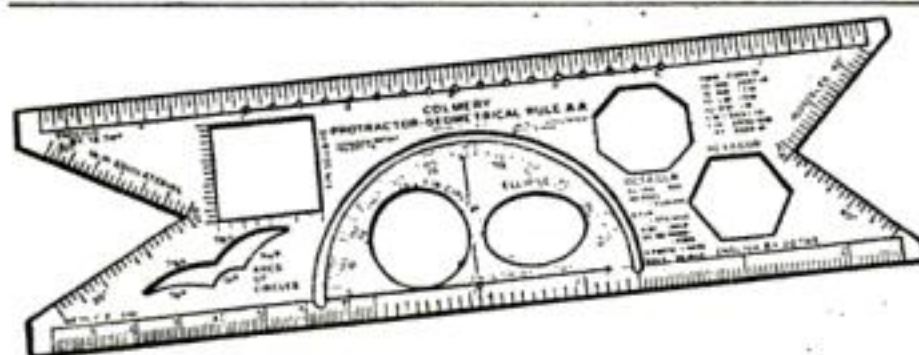
INTERSTATE TRAINING SERVICE
4035 N. E. Sandy, Portland 13, Oregon

Please see that I receive FREE BOOK "Getting Ahead In Diesel":

Name _____ Age _____

Address _____

City _____ Zone _____ State _____ (3)



NEW COMBINATION DRAWING INSTRUMENT 14 instruments in one

THE COLMERY PROTRACTOR GEOMETRICAL RULE

A completely new drawing tool—saves time and reduces manipulation of instruments in all types of engineering, architectural, and commercial drawing. Especially valuable for field sketching.

The Colmery Rule combines a protractor, English scale in 16ths, engineer's scale in 10ths and 20ths, metric scale in millimeters, metric-English conversion table, 60 and 90 degree angles for drawing isosceles and equilateral triangles, various geometric shapes and curves, a series of holes at 1/4-inch intervals for calibrating lines or drawing circles up to 8 inches in diameter.

Precision made of non-inflammable transparent plastic, assured accuracy, all markings indented. Comes in amber, green, blue, and rose tints, or clear. Beveled edges. **RULE AA—\$2.00**

Send check or money order for postpaid delivery. If not satisfied, return within 10 days for refund. Please state tint desired.

ALSO AVAILABLE: Students' Model Colmery Rule, made of lightweight plastic die-cut, with printed markings. Available in clear plastic only. **RULE A—50c**

PLASTIC ENTERPRISE, INC.

211 7th Street S.E.
Canton 3, Ohio

PRESTO! ANYONE CAN MASTER GLAZE

LEAVES HARD GLASS-LIKE FINISH
EASY TO APPLY
PROTECTS THE SURFACE
EASY TO KEEP CLEAN
NO SMOOR OR STREAKS AS WITH WAX
LASTS SIX MONTHS TO A YEAR
SEALS THE PORES OF THE SURFACE
WILL NOT FINGER-MARK
NO OILY FILM AS WITH POLISH
SAVES YOU MONEY

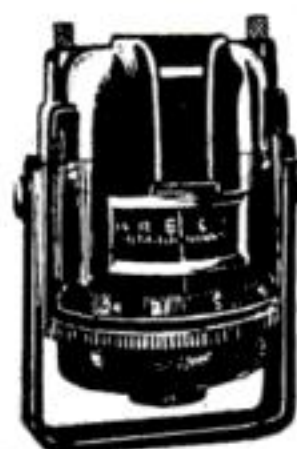
Car Owners! Meet Master Glaze—the sensationally different luster for new and used cars! Not a wax—not an oil polish—not a paint!—nothing that "smears" over the surface.

MASTER GLAZE is a unique discovery—a creamy liquid—quick and easy to apply! Gives a hard, glass-like surface. Even gasoline cannot dull it! Lasts six months to a year! Amazing luster—beautiful, sparkling clean and brilliant! Doesn't finger-mark—doesn't smear! A match box full glazes an entire car. Seals the pores—protects! **NOTHING LIKE IT!**

FREE SAMPLE

Just send your name and address to

MASTER GLAZE CO., 7720-664 W. Harwood Ave., Milwaukee, Wis.



M-6 COMPASS

Precision compass by "Sherrill" Easy to compensate, equipped with nite lite, excellent for planes, cars, boats, trucks, etc. Easily mounted. Instruction manual and calculator included. \$25.00 value.

FREE CATALOG
Over 250 Surplus Bargains

\$5.95
prepaid

WRITE TODAY!

FISLER SALES CO. DEPT. PS-1
723 WALNUT ST.
KANSAS CITY 6, MO.

WHEELS—WHEELS

5" disc wheel, 5/8" tire, 5/16 or 3/8" sleeve.....	\$0.30
6" disc wheel, 5/8" tire, 5/16 or 3/8" sleeve.....	\$0.35
7" disc wheel, molded tire, 3/4" sleeve.....	\$0.45
8" disc wheel, 1 1/8" tire, 1/2" sleeve.....	\$0.70
7" disc wheel, 1" tire, 1/2" ball bearing.....	\$0.80
8" disc wheel, 1 1/8" tire, 1/2" ball bearing.....	\$1.00
10" disc wheel, 1.75 semi-pneumatic tire, 1/2" B.B.....	\$1.50

Above wheels painted red
10" cast alum. wheel, 2 3/4" semi-pneumatic tire, 5/8" ball bearing..... \$4.50
Hub caps for 5", 6", 7" wheels..... 3c each Plus postage

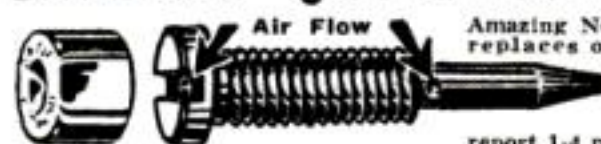
UNITED WHEEL STAMPING CO., Dept. PS-3
2756 W. 115th St. Chicago 43, Ill.



LEARN MEAT CUTTING

through actual practice. Profitable Meat Cutting and Successful Meat Merchandising taught easily, quickly. **LEARN BY DOING** at Toledo in just six short weeks under actual market conditions. For beginners or men with experience. All subjects taught thoroughly and completely. Diploma, Job help. Get store of own. People must eat. School in operation over 25 years. Approved for GI training. Send today for FREE illustrated catalog. No obligation. **NATIONAL SCHOOL OF MEAT CUTTING, Dept. 51-F, Toledo 4, Ohio**

SAVE GAS • get 1 to 4 EXTRA miles per gal.



State make, model and year. Also kind of carburetor. 6 cyl. cars use one, 8 cyl. cars use two.

Amazing New GANE Air-Flow needle replaces ordinary idle adjustment screw in your carburetor. **SAVES GAS.** Faster pickup. Easier starting. Perfect idling. Owners report 1-4 miles more per gallon. Thousands in use. **10-Day Money-Back guarantee.** Quickly installed on cars & trucks. Order yours Today! Complete with instructions. \$1.50 ea.

Cameron Mfg. Co. 539 E. ADAMS ST. DEPT. PS-349
PHOENIX, ARIZONA



MOCK-UP FOR TWO FUTURES

This full-size wooden model of an airplane is taking shape under the hands of *Northrop* engineering students. The completed mock-up will be an exact likeness of a new type plane that may help mold the future of private flying. As a means of practical training in *Aeronautical Engineering* it helps mold the futures of hundreds of young men.

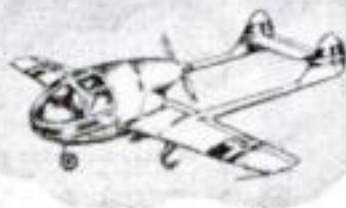
This mock-up is part of a typical *Northrop* training project. Students designed the airplane, prepared the working drawings, and built the mock-up to check on their design. They will make all the standard engineering tests, using the same methods as engineers in an actual aircraft engineering department.

This practical training prepares *Northrop* students to join the ranks of *Aeronautical Engineers* now designing the vast future of aviation. *Northrop* graduates are stepping directly into design, research, testing, aerodynamics, and power plant engineering...some are in such advanced work as guided missile design.

Northrop students know there is a big future in *Aeronautical Engineering*. It takes them only two short years to get ready. Send the coupon for full information.

The Airplane in the Making

Northrop aeronautical engineering students combined their ideas for the ideal private plane. A twin-boom pusher type, the propeller is placed between the two booms for safety from the whirling blades. The cabin arrangement permits pilot and passenger to step into the plane as easily as entering an auto.



Northrop Aeronautical Institute

Division of Northrop Aircraft, Inc. ★ James L. McKinley, Managing Director

1525 EAST BROADWAY, HAWTHORNE, LOS ANGELES COUNTY, CALIF.

APPROVED FOR VETERANS

NORTHROP AERONAUTICAL INSTITUTE

1525 East Broadway, Hawthorne, Los Angeles County, Calif.

Please send information on opportunities in Aeronautical Engineering, your catalog, and starting dates of classes. I am interested in:

☐ Aeronautical Engineering ☐ Aircraft & Engine Mechanics ☐

Name _____ Age _____

Address _____

City _____ Zone _____ State _____

Check one: ☐ Veteran ☐ Non-Veteran

Build This Model of Confederate Frigate "Alabama"

● Big, clear blueprints show all parts of 21½ in. hull model of famous Civil War Frigate, only \$1.00. Order Blueprint No. 335. FREE catalogue with your order! Address Popular Science, Dept. 39, 353 4th Ave., New York 10, N. Y.

How to Make Paper Flowers and Party Decorations

● Get this big how-to-do-it book for women! Tells how to create thousands of toys, gifts, decorations, favors and novelties with scissors and paper. Just send \$2.98 to Dept. 39, Foremost Books, 353 Fourth Ave., New York 10, N. Y.

Make BIG MONEY!



**SPARE OR FULL TIME
RIGHT IN YOUR OWN HOME**
Have Your Own Successful Business

Yes, lush fields of profit are waiting to be tapped in this new field. New MIRACLE finish gives a velvety, luxurious surface to radios, lamps, toys, signs, store displays, figurines - Makes old objects beautiful and salable - Makes new things worth much more. Learn in a few days - start earning BIG MONEY - up to \$500 or \$1000 per month full time - \$75 per week spare time. Everything furnished - including complete simple-to-understand instructions on this NEW method that is EASY to learn. Send NO MONEY - a post card will do - it's too good to miss! Write now for details, FREE sample of FLOK-KRAFT covered material; hundreds of useful and profitable IDEAS. Do it NOW!

No Experience Necessary



**Have Your
Own Lasting,
Successful
Business- Be
Your Own Boss-
Huge Demand**

FREE!!! DETAILS

COAST INDUSTRIES

Department PS-3

1507 W. Manchester Avenue

Los Angeles 44, Calif.



Name _____

Address _____

City _____

Zone _____ State _____

COAST INDUSTRIES, Dept. PS-3, 1507 W. Manchester Avenue, Los Angeles 44, Calif.

SEND COUPON TODAY!

500 Page Catalog—7,000 Gadgets & Novelties

Roto Picture Section, 3,500 Illustrations, 6-Color Cover

Novelties, gadgets, gifts, funmakers from all over world! Carnival, circus, world's fair and science exhibit rolled into one. Covers hobbies, useful gadgets, timesavers & ALL novelties. Money-makers, money-savers. Even live monkeys, shrunken skulls!

Puzzles
Jewelry
Hobbies
Gadgets
Billfolds
Cameras
Airplanes
Disguises
Fireworks
Exercisers
Magnifiers
Telescopes
Funmakers

Slide Rules
Barometers
Chameleons
Microscopes
Electric Eyes
Magic Tricks
Field Glasses
Money Savers
Curious Seeds
Skeleton Keys
Makeup Goods
Banks & Vaults
Rubber Stamps

Sporting Goods
Artist Supplies
Novelty Checks
Fortune Tellers
Symbol Jewelry
Office Novelties
Lucky Novelties
Occult Novelties
Indian Novelties
Fishing Supplies
Electric Shockers
Sweater Emblems
Projectors & Film

Hula Hula Skirts
Radios & Supplies
Engines—Motors
Western Novelties
Scientific Supplies
Religious Novelties
Home Printing Sets
Musical Instruments
Live Animals & Pets
Smoker's Novelties
Auto & Bike Accessories
1000 Fascinating Books
Many, Many Other Things

10c



Kits
Guns
Wigs
Jokes
Pipes
Locks
Boats
Rings
Tools
Games
Knives
Models
Turtles
Stamps

Collier's, Tide, Coronet, New Yorker Write About This Amazing Catalog!
25,000,000 orders in 35 years—our record. A catalog, but most wonderful book you've ever seen! Costs us 75c per copy to get out. Complete paper covered edition, 10c; De Luxe hard bound library edition, 25c. (Stamps accepted.) Sent Air Mail for \$1.00. Limit 1 per customer. Fast, 24-Hour Service.

JOHNSON SMITH & COMPANY

Dept. C-33

Detroit 7, Michigan

Gigantic Catalog Of Unusual Novelties

Johnson Smith & Co.

Dept. C-33, Detroit, Mich.

☐ Here's 10c. Rush Catalog

☐ Deluxe Bound Cat. 25c

Name _____

Address _____

GLASY-CAST New Liquid Plastic Cold-Set



15 TO 30 MINUTES FOR A FINISHED PRODUCT
No heat, or machinery required. Crystal clear, brilliant gloss in natural state. Colored pigments or dyes may be added for solid or transparent effect.
GLASY-CAST can be poured in flexible or rigid molds, including molds made from liquid rubber, Plaster of Paris, Elastomeric vinyl molds, and even certain types of wax molds. Glasy-Cast is a real money-making material and requires no experience.
MAKE BIG PROFITS with GLASY-CAST manufacturing novelties, toys, jewelry, etc. **EMBED FLOWERS, COINS,** biological specimens, and many other items in clear solid Glasy-Cast. Make your own Christmas gifts.

FREE INSTRUCTIONS WITH EACH ORDER OF GLASY-CAST

SMALL QUANTITIES AT WHOLESALE PRICES

1 quart. \$2.50, 1 gallon. \$9.50
5 gallon lots. \$8 per gallon
Prices FOB Boston

ELASTO-MOLD, A NEW FLEXIBLE mold material makes permanent production molds in a few minutes at low cost. No shrinkage. Practically 100% efficient for use in casting Glasy-Cast as well as any other plastic material.

Hundreds of castings can be made from Elasto-Molds, instructions with each order. Prices on request.

WE ALSO SELL GENUINE LIQUID RUBBER at \$5.50 per gallon FOB Boston. Write for free sample of Elasto-Mold and Glasy-Cast casting. Money Back Guarantee if not satisfied.

PLASTIC SERVICE, Dept. M-6
294 Washington Street, Rm. 813, Boston 8, Mass.

HAVE THAT BOLD, VIRILE LOOK!

Sportflex

TRIMS and SLIMS you

Gently, FIRMLY restrains bulges; eases you into upright, perfect posture. You look—you feel younger!

Of quality Lastex; sturdy, resilient, porous, non-chafing. Wide 2-Way Stretch Band can't roll, bunch or bind. Soft, smooth, detachable Crotch gives sanitary, super-support. Launderers like magic.

AN UNBEATABLE BUY



complete postpaid **\$3.00**
extra crotch.....**75c**

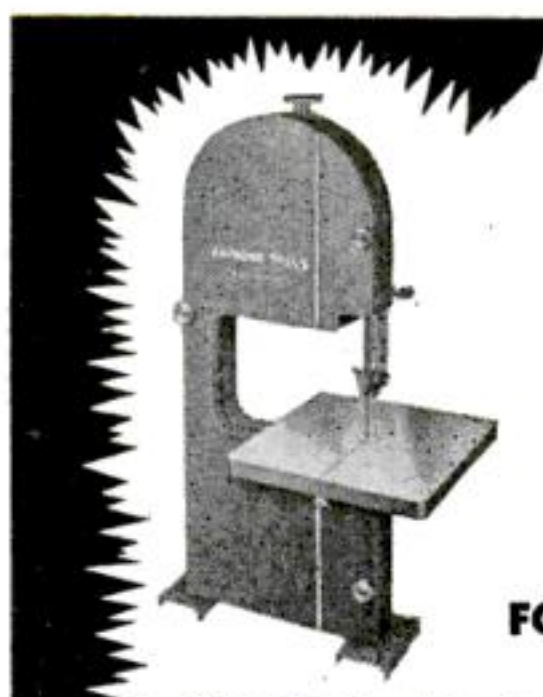
SITTING

STANDING

IN ACTION

Count on **SPORTFLEX** for comfortable, contour control
DON'T DELAY! Send CHECK—MONEY ORDER Today
IMPORTANT! Please specify waist size. C.O.D.'s accepted

Sportex Foundations
Dept. P.S., 14 W. 17 St. N.Y. 11, N.Y.



NEW BAND SAW

\$45 VALUE
FOR \$29.95

Unheard of value—Sturdy all metal 10-inch bandsaw, cuts wood, metal, etc. Compares with saws costing \$45. or more. Special introductory price for limited time only—\$29.95, complete.

FREE literature. Write today for details; or save time by sending remittance NOW with name and address. **SATISFACTION GUARANTEED.**

RAYMOND TOOLS CO.
1305-T Glenwood Ave. Minneapolis, Minnesota

RUPTURED?

Get Relief This Proven Way

Why try to worry along with trusses that gouge your flesh—press heavily on hips and spine—enlarge opening—fail to hold rupture? You need the Cluthe. No leg-straps or cutting belts. Automatic adjustable pad holds at real opening—follows every body movement with instant increased support in case of strain. Cannot slip whether at work or play. Light. Waterproof. Can be worn in bath. Send for amazing **FREE** book, "Advice To Ruptured," and details of liberal truthful 60-day trial offer. Also endorsements from grateful users in your neighborhood. Write:

Cluthe Sons, Dept. 14, Bloomfield, New Jersey



EARN EXTRA MONEY

MAKE YOUR OWN LEATHER BELTS-BILLFOLDS

LEATHER CRAFT... Learn this easy and simple way to make money. Make all kinds of hand-tooled leather goods. Hinkley-Tandy has everything for Leather Craft... Modelling Tools, Leather, etc. Write today!

Send For **FREE CATALOG** Dept. P.S.

HINKLEY-TANDY LEATHER COMPANY

P. O. BOX 791 • FORT WORTH 1, TEXAS

Learn PHOTOGRAPHY at Home

Splendid Hobby or Vocation

Prepare in spare time. Practical basic training. Long-established school. Send for free booklet, "Opportunities in Modern Photography" and particulars. Sent postage prepaid. No obligation.

AMERICAN SCHOOL OF PHOTOGRAPHY

1815 S. Michigan Avenue, Dept. 1363 Chicago 5, Illinois



DUAL TAIL PIPE EXTENSION

Fits all cars—chrome plated

DEEP TONE

\$2.95

produced by 2 1/2 inch outlets
Postage free on prepaid orders
TRADE INQUIRIES INVITED

LYONS PRODUCTS COMPANY

Pat. Pend. 2426 So. LaBrea Ave., Dept. PS-3, Los Angeles 16, Calif.

BASHFUL BUNNY

LIGHTS UP WHEN YOU
TICKLE ITS TUMMY!



- The Ideal Easter Gift
- Has Electric Light Eyes That Lite Up and Shine
- Fascinating to Young & Old Alike

**SEND
NO MONEY.**

Rush your order to-day. Remit with your order, and we pay postage or order C.O.D. plus postage.

\$2.98
COMPLETE

Here's a bunny who's completely captivating . . . tickle his tummy and his eyes light up to show you he loves you! Battery and two colored bulbs come completely assembled . . . can be easily removed and replaced to last a lifetime. He's all pink and white, with the perkier ears, a set of proud whiskers, and a bonny blue ribbon to tie around his neck.

NOVELTY MART

59 East 8th Street, Dept 25 New York 3, N. Y.



**PARKING
\$2.95 AID**

SET — POSTPAID
Fastens to each right fender in a few minutes. Makes scraping sound on curb easily heard in car. Four-way adjustment for wear, height from ground, and from fenders. No wiring to hook up. Chrome

and stainless steel — can't rust. 10 day money-back guarantee. No C. O. D. \$2.95 SET — POSTPAID.
PARK AID • BOX 3 • BRAZIL, IND.

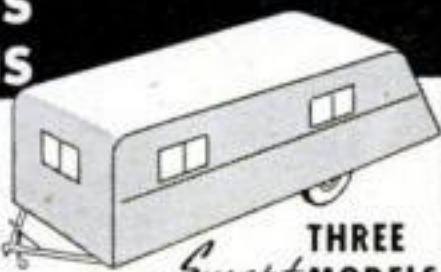
BUILD YOUR OWN TRAILER
with **NATIONAL'S**
Easy-to-Read **PLANS**

Here it is! Your own full size house on wheels . . . or if you prefer, a sleek sports trailer that will add new thrills to your vacation. Easy to read, easy to follow instructions and a complete "cost of materials" with every plan.

**ORDER ALL THREE
GET ONE FREE!**

Set of 3...\$2

FREE! Big illustrated parts Catalog with Any Order!



**THREE
Smart MODELS**

Model 27 27-foot Luxury Liner, 35'100 rooms, toilet. Sleeps 6.

Model 20 20-foot Cabin Trailer, 31'00 tops for looks. Sleeps 4.

Model 10 Sports Trailer for hunting, fishing. Sleeps 2. 50¢

NATIONAL TRAILER STORES

Dept. PS-Box 2353 Terminal Annex • Los Angeles 54, Calif.

PROVED!
— AND APPROVED

America's
LOWEST COST
Transportation
Cushman
MOTOR SCOOTER



GET UP TO
75 MILES
PER
GAL.

OWN IT! MAINTAIN IT!
OPERATE IT! ALL FOR LESS
THAN 1¢ A MILE

CUSHMAN MOTOR SCOOTERS are the world's best buy in low-cost transportation. Motor to work, to play, to market, to school—EVERYWHERE—quickly, conveniently, economically! No parking worries—no garage problem! No battery or radiator to maintain! No expensive upkeep or replacements! There's a CUSHMAN for every transportation need. Get the facts today.

See your dealer or write Dept. PS-29.

DEALER
INQUIRIES
INVITED

CUSHMAN MOTOR WORKS, Inc
LINCOLN NEBRASKA U.S.A.

**SO HANDY FOR
SO MANY USES**

**AT HOME
OFFICE AND SHOP**

**THE
JIFFY
METAL
CABINET**

**Now you can keep
nuts, bolts, screws,
nails, parts, wash-
ers, stamps, hobby-
ist needs, etc., at your fingertips.**

Just think, 32 or 64 drawer cabinet to keep those small items that usually get mislaid. Spot welded steel cabinet, enamel finish, metal drawer guides. Looks good anywhere. Send check or money order please—no C.O.D.'s. Prices below. Your money refunded if not satisfied.

**32 DRAWER
MODEL PICTURED
ONLY
\$5.95
POST PAID**



SPECIFICATIONS	WITH ALUMINUM DRAWERS	WITH CARDBOARD DRAWERS
32 Drawer Unit 6" Deep 12 3/4" Wide 15 1/4" High	One piece rustproof aluminum drawers for heavy service—good for work bench and industry use.	Suitable for most home uses. Heavy board kraft covered. Metal drawer pulls.
64 Drawer Unit 6" Deep 25 1/2" Wide 15 1/4" High	32 drw. \$8.95	32 drw. \$5.95
Drawer Size 1 1/4" Deep 2 3/4" Wide 6" Long	64 drw. \$15.95	64 drw. \$9.95
	POSTAGE PAID	POSTAGE PAID

KAYTEE PRODUCTS DEPT. S BOX 588 CANTON O.



**MADE \$14 PER DAY
While Still Learning**

"By the time I finished half your course, I was making \$14.00 per day. I have made enough on the side to more than pay for the course—"
T.E.H.—West Virginia

**LEARN ELECTRIC
APPLIANCE**

**We Teach
How to Repair
Washing
Machines
Vacuum
Cleaners
Electric Ranges
Lamps, Motors,
Irons, etc.
REFRIGERATION
and
House Wiring
At Home
In Your
Spare Time!**

REPAIR & SERVICE
For a man handy with tools, and happiest when working with his hands, OPPORTUNITY is Wide Open Today in this great and growing field. Everyone is a customer for the man trained to service electric appliances.

OPEN YOUR OWN SHOP
Our practical HOME COURSE teaches you this business from A to Z preparing you to take a well paid job or open your own shop. You can actually start in your basement or garage with the tools I send you . . . before finishing.
**We Include An
ELECTRICAL
APPLIANCE
TESTER
A Big Kit
of Tools at
NO EXTRA COST**

MAIL THIS COUPON for FREE BOOK

PACIFIC TRAINING SCHOOL
7217 So. Broadway, Dept. S-93, Los Angeles 3, Calif.

Dear Sirs: Please send me, without obligation, your free booklet and complete details.

Name.....

Address.....

City..... State.....



**Say, Have You
Tried this Amazing
"33"?**
E-L-A-S-T-I-C

Miles Ahead of Any Putty!



**2 lbs.
ONLY
50¢**

**SPECIAL
OFFER** If your dealer hasn't "33", send us 50¢ and get 2-lb. can postpaid. Money back, if not entirely pleased. **THE ARMSTRONG COMPANY, 4057 S. La-Salle St., Chicago 9.**

STOP USING messy, lumpy putty for glazing repairs on windows and doors. **ARM-STRONG'S "33"** is permanently **E-L-A-S-T-I-C** (secret formula). Unlike putty, it spreads on smoothly—can be painted immediately. Unlike putty, it won't crack or crumble in years of service. **NEVER** gets rock-hard in container, or after being applied. Costs little. **TRY IT!**

**LEARN WATCH & CLOCK REPAIRING AT HOME
WITH OUR Enlarged SELF-TRAINING KIT**



Get started **NOW** in this uncrowded field! **EASY** to learn! **BIG MONEY! SECURE FUTURE!** Earn while you learn! Even as a sideline you can make \$50 and up each week.—Our new **PRACTICAL SELF-TRAINING KIT** is all you need. Contains set of **PROFESSIONAL TOOLS**; (Loupe, 3-4 power; Complete Set of 6 Special Screw Drivers—finest tempered steel blades; Special Clock Screw Driver; Tweezer AA; Special Clock Tweezer; Plastic Material Tray) and **2 COMPLETE BOOKS**: "Modern Watch Repairing," also "Clock Repairing & Making." Fully illustrated, easy to understand, shows every step in repair, adjustment and use of tools. Only **\$8.95 Post Paid** (if C.O.D., plus charges.) **Money Back Guarantee.** If ordered separately: Each book \$2.65; set of tools \$4.95. **Special WATCH & CLOCK REPAIR DEPT.** for advanced jobs. Lowest prices. Send watch or clock for free estimate.

MODERN TECHNICAL SUPPLY CO.
Dept. MP5, 55 W. 42nd Street, New York 18, N. Y.
Complete Precision Tool, Material & Book Catalog for Watch-Clockmakers, Jewelers, Tool-Instrument Makers, Handicrafters. Over 600 ILLUSTRATIONS. **SEND 25c for catalog—FREE with order.**

BUY DIRECT! SAVE ON
BASEBALL UNIFORMS **6.95**
LETTERING AT NO EXTRA COST **5.75**
TEAM MGRS. These big league cut, large, roomy uniforms are quality tailored of sturdy Cricket Cloth, \$11.95 Value. Our price only \$6.95. 10 letters sewn on free. Write for illustrated catalog and fabric samples. Equal Savings on all other baseball equipment.
BACHARACH RASIN CO.
Dept. 34 14 N. Howard St. Baltimore 1, Md.

VENETIAN BLIND
Accessories, Replacement Parts

SAVE 50% on your own repair jobs. Make big money repairing for others! No special tools needed. Complete line, 16 colors, tapes, cords, etc. Rust, gray, light green, dark green, light blue, medium blue, dark blue, peach, duck, mingled, white, black, chocolate, tea rose, red, wine, canary. Guaranteed 1st grade. Tape—65c yd. Cord—10c yd. (write for special prices on rolls). Give width and length of slat and window height. Send payment or we send COD if you pay postage. Order NOW from

AMERICAL VENETIAN BLIND COMPANY
Dept. A 2334 First Ave. New York 35, N. Y.

**EYE-
GLASSES
BY MAIL**



16 Days Trial

Write Today for Free Catalog. Send no Money
ADVANCE SPECTACLE COMPANY
537 South Dearborn Street, Dept. SP-3, Chicago, Illinois

Start Your Career in 6 to 36 Months With Our Unique Step by Step Training

Each course unit at the Milwaukee School of Engineering is complete in itself. All courses begin with practical training in the school's complete laboratories—and prepare you for specific occupational objectives or advanced training. More than 1,500 students now enrolled from 48 states and 18 overseas countries. Faculty of 85 specialists, 35,000 former students in industry all over the world.

MILWAUKEE SCHOOL OF ENGINEERING



A Technical Institute
Founded in 1903
by Oscar Werwath



Courses Available at Vocational, Technical and Professional Level

SERVICE	TECHNICIAN	PROFESSIONAL
6 to 12 Months	1 to 2 Years	3 Years
• Electricity	• Electrotechnics (Power)	• Electrical Engineering
• Welding	• Radio and Television	• Bachelor of Science
• Refrigeration	• Electronics	• Degree
• Heating	• Refrigeration, Heating and Air Conditioning	• Major in Electronics or Power

MILWAUKEE SCHOOL OF ENGINEERING

Dept. MI-248, N. Broadway and E. State, Milwaukee, Wis.

Without obligation send me free booklet "Career Building" and more details on course in.....

Name.....Age.....

Address.....

City.....State.....

Terms Start April, July, September, January... SEND COUPON TODAY



WAR SURPLUS BARGAINS

**\$500,000.00 INVENTORY for
QUICK LIQUIDATION**

Surplus Items—hundreds of them for home, shop, factory, farm and outdoor use. New items, used items, reconditioned items—all at tremendous savings—all priced for quick sale.

PAGE AFTER PAGE OF VALUES

This big catalog shows page after page of amazing money saving values. Write for your copy today. Send 10c to cover postage, mailing, etc. Write today!

SEND TODAY FOR YOUR COPY

STARK'S

509 So. State St.
Dept. PS-2
CHICAGO 5, ILL.



DRAFTING *is always* the BIG PAY FIELD

GET STARTED NOW! I WILL TRAIN YOU AT HOME UNTIL YOU GET A GOOD PAY JOB

Get a better job with more pay and pleasant working conditions. Get into Drafting—where all products start—where the Draftsman is the key man—where promotions to tool designer—industrial and product design—engineers—rate the very top pay. I will train you at home until you get a good pay job and give you real experience on the same kind of jobs you will do with the best paying firms. I furnish instruments and all equipment when you start. Write today for vital facts and FREE book. Give age.

ENGINEER DOBE

Division 23 Libertyville, Ill.

**TOOLS
DRAFTING
TABLE and
Complete
Outfit Sent
When You
Start!**

PRESSURE QUEEN

*Outperforms
them all!*

THE only portable air compressor having 4 cylinders in space usually required for one—absolutely no pulsation. Does more painting in an hour than hand brushing in a day. Lubricates machinery, inflates tires. Ideal for home,

farm, service station, machine shop and contracting painter. Powered by gas engine or electric motor.

*Write for
Literature
and Prices*



THE CAMPBELL-HAUSFELD CO.

151 RAILROAD AVENUE HARRISON, OHIO

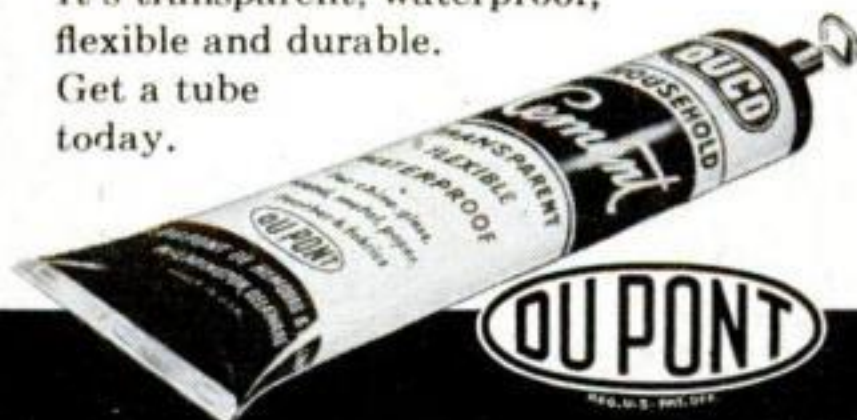


"SAVE IT AND
FIX IT"

REPAIRS

CHINA, TOYS, FURNITURE
BOOKS AND LUGGAGE

It's transparent, waterproof,
flexible and durable.
Get a tube
today.



DUCO CEMENT

REG. U. S. PAT. OFF.

**UP TO 80% SAVINGS
ON WAR SURPLUS**

LT. WT. ALUMINUM PIANO HINGE

Length 72
inches,
thickness
.040—width
1 1/4"—
Operating
radius 275
degrees. Made of
aluminum alloy,
sold in 6 feet
lengths only—**\$1.14**
per length....

HEAVY DUTY STEEL PIANO HINGE

Length 56"—Thickness 3/32"—
Width (open) 3-5/16"—Operating
radius 330 degrees—Made of heavy
duty steel—Drilled ready for use.
Ideal for drop tables, heavy tool
boxes, heavy doors, and many other
uses where heavy hinges are re-
quired. Sold in 56" lengths only.
Ship. Wt. 7 lbs. At a frac-
tion of original cost.... **\$1.45**



LIVE RUBBER SHOCK CORD

Made in accordance with rigid army
specification. Clean fresh stock.
3/8" contains approx. 500 strands
of live rubber, 3/8" approx. 100
strands, 1/4" approx. 40 strands.
Sold in 25 ft. lengths or more.
At about 20% of original cost.
DIA. PRICE (per 25') Ship. Wt.
1/4" \$1.00 2 lbs.
3/8" \$1.25 2 lbs.
5/8" \$1.75 3 lbs.

HEATING ELEMENTS

For home made photo print dryers,
chicken brooders, etc. Wiring dia-
gram for use on 110-volt. **96c**
Set of four

NEW 10 1/2 x 4 WHEEL ASSEMBLY

6 ply tire 10" high, 4" wide plus new tube plus 4"
ball bearing wheel with grease fitting. Uses 5/8"
axle. Ideal for midget soapbox racers, wheel-bar-
rows, trailers, etc. Ship. wt. 8 1/2 lb. **\$9.95**
ONLY

NEW 27 IN. WHEEL ASSEMBLY

New 8 ply tire, 27" high, 9" wide plus new tube plus new 27" roller
bearing aircraft wheel. A tire with plenty of traction. Wonderful for
heavy duty auto and house trailers also farm implements. **\$37.50**
Load capacity 3500 lbs. Shipping wt. 65 lbs. A real buy at

56 INCH TIRE & TUBE

New, non skid, 16 ply tire 56" high, 18 1/2" wide, 27" rim diameter
plus new tube. Load capacity 27,500 lb. Ideal for earth movers and
heavy farm equipment. Shipping wt. 245 lb. **\$60.00**
Tire & tube

Prices F.O.B. Chicago. Include approx. postage on orders paid for in
advance. C.O.D. orders enclose 25%, balance sent C.O.D. WRITE
FOR FREE ILLUSTRATED CIRCULAR.

U. A. S. Corp. Dept. PS-3 5637 W. 63rd Pl.
Chicago, Illinois

LEARN CELESTIAL NAVIGATION



COMPLETE COURSE OF
INSTRUCTIONS AND VALUABLE
ACCESSORIES GIVEN FREE
WITH \$200.00 SEXTANT

ALL FOR **\$14.95**
ONLY

IT'S A ONCE-IN-A-LIFETIME VALUE!

Learn navigation from same course as used by the Gov't to
train our birdmen. Take readings from the sun or other heav-
ily bodies from your porch or back yard to determine your
position within a few feet on land; within a mile when on a
ship at sea.

GENUINE LINK PRECISION SEXTANT

This famous (war surplus) Sextant originally cost \$200.00.
You can buy it now for only \$14.95 and with it we will give
you the instruction course on Celestial Navigation; also com-
plete sextant instructions. Sextant is fitted with night light-
ing attachment, easy reading vernier scale and
good indicating bubbles. Slightly used but guar-
anteed perfect. Carrying case included. Ship. **\$14.95**
Wgt. 12 lbs. Send check or money order. Only

AERO PARTS SUPPLY, Dept. PS3
Municipal Airport Houston 17, Texas

ONE YEAR WRITTEN GUARANTEE!

ARMY AIR CORPS 16 JEWEL

ELGIN

\$19.95



Made for Pilots and Navigators of the U. S. Army Air Forces.
They had to be good. Sturdy 16 Jewel Elgin men's wrist watches.
Shock resistant. Sweep second hand. Luminous hands and dial.
Stainless steel back. Unbreakable crystal. Water repellent. Made
by ELGIN one of America's outstanding watch manufacturers.
Fully reconditioned. One year written guarantee sent with each
watch. Supply limited! **SEND NO MONEY.** Simply pay postman
\$19.95 plus 10% tax and postage on delivery. Cash orders sent
postpaid. United Products Co., 7941 S. Halsted, Dept. RES-1520,
Chicago 20.

FREE FOR YOU TECHNICAL DATA CARD

Radio Electrical Color Codes, Formulas, Helpful Hints.
Send for yours today.

PHONO AMPLIFIER—PHONO OSC

2 Tube AC-DC.....	\$1.39	2 Tube AC-DC.....	\$2.75
50L6-35Z5.....	\$1.00	12SA7-35Z5.....	\$1.20
3 Tube AC-DC.....	\$1.69	All Wired & Tested	
Volume & Tone		Output trans.....	35c
12SQ7, 35Z5, 50L6 \$1.45		5" PM Speaker.....	\$1.19
Velvet Mixer Record Changer, Plays 10" & 12" Records at the same time. 14"x14" \$15.50, 2 for \$28.00. Order from this ad today. Free 1949 Catalog—25% on COD orders.			

RADIO MAIL ORDERS

25 W. Broadway, N. Y. 7



RHEUMATISM HIGH BLOOD PRESSURE

ARTHRITIS - NEURITIS - SCIATICA

Enjoy a vacation in Florida's health-giving sunshine
while you receive our marvelous scientific treatment.
Thousands have found relief after other treatments have failed!
Write for FREE literature "F" today.

LOFFLER CHIROPRACTIC CLINIC JACKSONVILLE 5, FLA.



ARC WELDER

\$5.95

Complete

A sturdy, compact, metal Arc Weld-
ing Outfit for light welding. For home
workshops, mechanics, farmers, etc.
Repairs toys, fenders and other steel
or galvanized items, 16 ga. Every-
thing you need—Welder, Helmet,
Rods, Attachments, Instructions. Only
\$5.95 postpaid, or C.O.D. plus few
cents postage. Ten-day Trial Offer.
Money back guarantee if not satisfied.

MINEX MFG. CO., 183 Debolt St., Newtown, Ohio



Learn ENGINEERING DRAFTING...BUILDING in Chicago, Industrial Hub

Approved for
G.I. Training

Time-Saving
Courses

Day & Evening
Classes

**1 YEAR • 2 YEAR
3 YEAR COURSES**

**BUILDING
DRAFTING
ENGINEERING
AIR CONDITIONING
REFRIGERATION
ELECTRICITY
RADIO**

Get your training at Chicago Tech in the Nation's industrial center. Chicago provides unequalled opportunities for part-time employment while training and for permanent positions upon graduation. Many other cultural and recreational advantages described in Catalog—sent Free!

Chicago Tech, founded 45 years ago, has trained thousands of men now occupying important places in industry the world over. Training combines theory and practice in 1 year, 2 year, and 3 year (Degree) courses. Saving in time means earlier graduation—and consequently earlier employment.

Terms start January, April, July and October. Get information now to arrange for early admission and accommodations.

**CHICAGO
TECHNICAL COLLEGE**
C-88 Tech Bldg.
2000 So. Michigan Ave.
Chicago 16, Ill.



MAIL COUPON TODAY

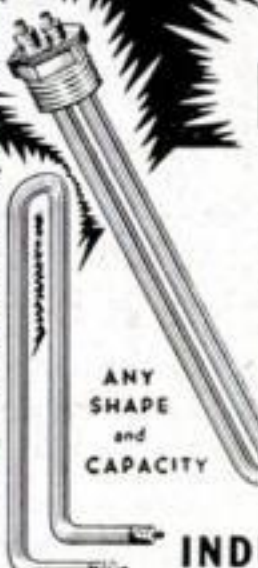
CHICAGO TECHNICAL COLLEGE
C-88 Tech Bldg., 2000 So. Michigan Ave.
Chicago 16, Ill.

Please send me without obligation free booklet on Time-Saving Technical Training.

Name.....Age.....

Address.....

City.....Zone.....State.....



HEATING ELEMENTS

FOR MANUFACTURERS

Whatever you manufacture that requires dependable electric heat, there is a Hestube Element to fit your needs. Hestubes are shipped from stock, or made to your specifications. Our engineers will help you. Tell us your requirements and get our price before you buy.

ANY
SHAPE
and
CAPACITY

FOR: Glue pots, baths, sterilizers, ovens, driers, and conduction, immersion and space heating of all kinds.

ECONOMICAL
in Quantities of
1 to 100
OR MORE

INDUSTRIAL ELEC. MFG. CO.
126 HUBBARD ST., ALLEGAN, MICH.

Command Bigger Money! STUDY LAW

STUDY AT HOME for BUSINESS SUCCESS and LARGER PERSONAL EARNINGS. 40 years expert instruction—over 114,000 students enrolled. LL.B Degree awarded. All text material furnished. Easy payment plan. Send now for FREE BOOK—"Law and Executive Guidance." It explains the course—how you may enroll and the many ways you may profit from Law Study. Write TODAY to:

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 12-PS, 646 N. Michigan Ave., Chicago 11, Ill.

Learn this Profitable Profession



**IN 90 DAYS
AT HOME**

Money-Making Career Open to Men and Women, 18 to 50

Hundreds of men and women between 18 and 50 make \$10 to \$20 in a single day giving scientific Swedish Massage and Hydro-Therapy treatments. There is big demand from doctors, hospitals, sanatoriums and clubs. Graduates earn large full time incomes from these or in private practice in their own offices. Others make good money from home treatments given in spare time. Learn this interesting, money-making profession in your own home, through our home study course. Same instructors as in our nationally known resident school. You can win independence and prepare for future security by qualifying for your Diploma. Course can be completed in 3 to 4 months. Many earn while they learn. Begin your training at once.

Anatomy Charts & Booklet FREE

Enroll now and we will include, at no extra cost, many needed supplies. Fit yourself to help meet growing demand for Scientific Swedish Massage. Send the coupon at once for complete details, Anatomy Charts and 32-Page Illustrated Booklet, FREE, postpaid.



THE COLLEGE OF SWEDISH MESSAGE
Dept. 970C, 41 E. Pearson, Chicago 11

Please send me FREE and postpaid, Anatomy Charts, 32-page Booklet and complete details on Home Training.

Name.....Age.....

Address.....

City.....State.....

MARCH 1949 61

Now! ENJOY Sound Movies
with the *New* Amazing

APOLLO Sound PROJECTOR!

16mm

"BROADCASTS" SOUND THROUGH
YOUR RADIO SPEAKER!

COSTS LESS THAN SILENT
PROJECTORS

UTILIZES "INFRA-RED" RAYS
Replaces old fashioned sound
systems!

- Plays at home—in classrooms—any-where!
- No wires or attachments to connect.
- Lightweight—only 16 lbs.
- Compact—precision-machined.
- Simplest to thread.
- Projects silent films too.
- Thoroughly Test-Proved.
- 2" Achromatic Lens
- Guaranteed safe for films.

THRILLS AND ENJOYMENT
FOR EVERYONE

Bring Hollywood's finest into your living room! Dramas—Musicals—Comedies—Education!—Travel!—all in glorious life-like sound—at less than the cost of a silent projector—all yours with the New Amazing Apollo sound projector

10 DAY FREE TRIAL OFFER

Your money back if you are not completely satisfied!

Mail your order, down payment short note about yourself and two references. In a few days your APOLLO Sound Projector will be on its way to you.

FOR ALL
16mm
SOUND
AND SILENT
FILMS

FOR ONLY
\$129.50
\$12.95
Down
Balance Monthly

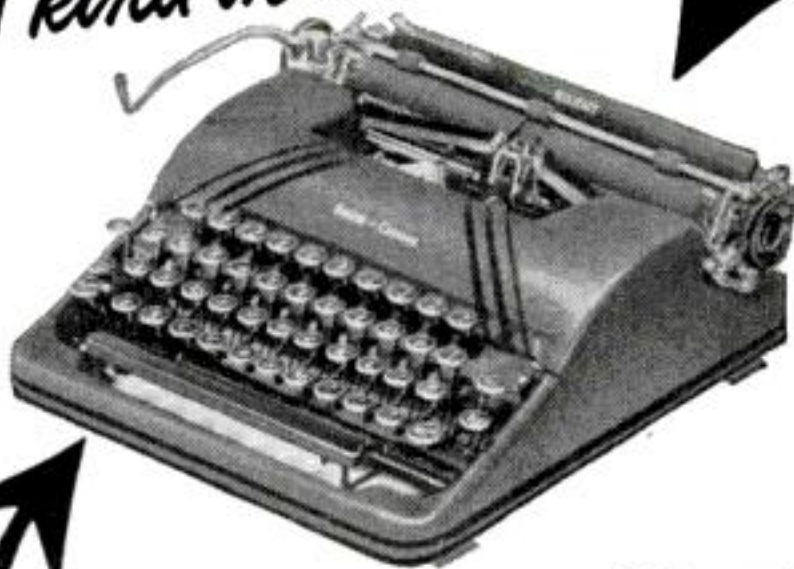
on the General's
"Pay-As-You-Shoot"
Plan

ORDER THIS
EASY WAY

THE GENERAL CAMERA COMPANY

Mail Order Division, Dept. PE Chicago 45, Ill.

*"The finest precision
writing instrument of
its kind in the world"*



If you want speed, rugged dependability and the finest typing features... you'll find the Smith-Corona better than any other portable. Ask your dealer. Ask him also about his easy payment terms.

Smith-Corona
PORTABLE TYPEWRITER

Getting Deaf?

Thousands now know there is no excuse for letting deafness kill the joy of living. An amazing new radionict hearing device has been perfected in the great Zenith Radio laboratories—so simple—so easy to use it can be sent to you for 10-day free trial.* Ready to wear, no individual fitting necessary. Accepted by the American Medical Association, Council on Physical Medicine. Come out of that world of silence. Write today for full details to Zenith Radio Corp., Hearing Aid Division, Dept. PS39, 5801 Dickens Ave., Chicago 39, Illinois. Made by the makers of world-famous Zenith Radios.

*Trial offer available on direct sales by Zenith Radio Corporation or its subsidiaries. †®

LUMINOUS PAINT

GLOWS IN THE DARK!



NOW you can paint any article or part of an article Brilliant Green, Misty Violet, Bright Blue, Radiant Orange, Blue-Green, Golden Yellow and Orchid. Beautiful, standard colors by day that glow brilliantly at night! Thousands of uses! Liberal size can any color sent postpaid for only 89c. FREE illustrated catalog, LUMINOUS SAMPLE DISPLAY cards show how RADI-GLOW paints can be used.

CHEMICAL PRODUCTS COMPANY
1412 Great Northern Bldg.,
Dept. 102, Chicago 4, Ill.

89¢
PER CAN

SEND FOR FREE CATALOG!

ARTISTS MAKE MONEY

DO YOU LIKE TO DRAW?

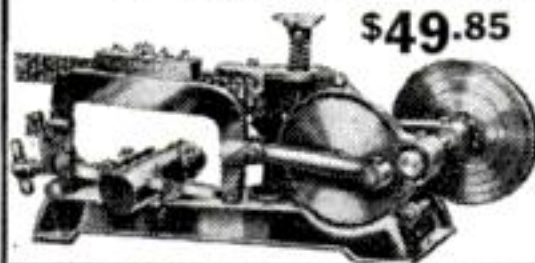
Send name, address, age and occupation for FREE ART TEST, to find out your ability.

ART INSTRUCTION, INC.

3149 Art Instruction Bldg., Minneapolis 15, Minn.

POWER HACKSAWS

\$49.85 4x4" Bench Model
as illustrated



F.O.B. Kalamazoo, Mich.

other models up to 8"

J. E. KANDLER CO.
KALAMAZOO 12, MICH

DEPENDABLE CRAFT SUPPLIES

LEATHER CRAFT • PLASTICS • POTTERY CRAFT
BLOCK PRINTING • BELT CRAFT
TEXTILE COLORS • POWER TOOLS • WOOD BURNING
INSTRUCTION BOOKS • WRITE FOR CATALOG

DWINNELL CRAFT SHOP

Dept. PS-93

Elm Grove, Wheeling, W. Va.

SUIT YOURS AS A BONUS

And Big Money in Spare Time, Too

We want you to wear this fine made-to-measure suit! Make it yours by sending a few orders, and earn BIG CASH PROFITS in spare time. Your suit will help you get more orders with scores of rich, quality fabrics, tailored-to-measure to newest styles. Also Ladies' Tailored Suits—complete line. Write today for FREE SAMPLES. No experience, no money needed. For quick action tell us about yourself.

J. C. FIELD & SON, Inc.

Harrison and Throop Sts., Dept. Q-1720, Chicago 7, Ill.



\$5,785.00 A Year in AUTO BODY and FENDER REPAIR

Says a STEVINSON SCHOOL Graduate

That's the possibilities of this old, established, profitable field. Men with "know how" and aptitude for this business should make up to \$110 weekly. If you like to work with tools, investigate this school.

Own your own Business, or have a Big Pay Job

Keep busy at top pay all year around . . . No slack season. JUST 36 WEEKS show you the tricks of the trade. Write for FREE information. G.I. Approved. Est. 1922.

STEVINSON AUTO & ELEC. SCHOOL

2006 Main

Kansas City, Mo.

**WOULD YOU SPEND 10¢ TO LEARN
DAN LURIE'S MUSCLE BUILDING SECRETS?**



DAN LURIE four time winner "AMERICA'S MOST MUSCULAR MAN" shows all the finest, lowest priced body-building equipment in one complete, sixteen page catalog of BARBELLS and health equipment.

This is the same guaranteed method that champions throughout the world use. Dan Lurie says, "Either I show you, without the bunk and baloney, how to turn your flesh into power-packed muscles or back goes your dime. You can't afford to wait. Write today!"

Send for the big, three color catalog mentioned above now! Only 10 cents . . . no stamps please. POSTAGE FREE

DAN LURIE BARBELL COMPANY
Dept. 170C, 1729-S. Rockaway Parkway
BROOKLYN 12 NEW YORK



**WAR
SURPLUS
BARGAINS**

**\$500,000.00 INVENTORY for
QUICK LIQUIDATION**

Surplus items—hundreds of them for home, shop, factory, farm and outdoor use. New items, used items, reconditioned items—all at tremendous savings—all priced for quick sale.

PAGE AFTER PAGE OF VALUES

This big catalog shows page after page of amazing money saving values. Write for your copy today. Send 10¢ to cover postage, mailing, etc. Write today!

SEND TODAY FOR YOUR COPY

STARK'S

509 So. State St.
Dept. PS-2A
CHICAGO 5, ILL.

10c

FIREWORKS

CHINESE FIRE CRACKERS

1 Bundle or 1280—1 1/2" Crackers..... \$2.50
1 Bundle or 1600—1 1/2" Crackers..... 3.00
8 Bundles to a case

BALLOONS—LATEX RUBBER

No. K 10, per gross..... \$1.00
No. K 20, per gross..... 2.40

Wholesale only. Send Remittance with Order.

UNITED FIREWORKS MFG. CO., INC.

Dayton 7, Ohio

Get This VALUABLE BOOK of SHOP TRICKS!



Thousands
sold at 15¢...
now it's yours
for the cost
of handling
and mailing!

**CONTAINS 19 EXTRA USES FOR YOUR LATHE AND
DRILL PRESS . . . SHOP KINKS TO HELP YOU GET
MORE AND BETTER WORK FROM THESE VERSATILE
TOOLS**

Just Mail Coupon and 10¢ . . .

Booklet Will Be Sent You By Return Mail

Be sure to see the new Jacobs Hand-Tite and Hex-Key Chucks. Both have the amazing new Rubber-Flex Collet that gives terrific gripping power, better accuracy, longer life. They'll put more work in your workshop. At your hardware dealer's.

IF IT'S A JACOBS...IT HOLDS



HEX-KEY CHUCK...fits drill press spindles—motor shafts—jack shafts. With Morse taper arbor, fits lathe headstock, tailstock. 4 models, capacities to 1/2"; fits 1/2" or 3/8" shafts.



HAND-TITE CHUCK . . . fits threaded spindle hand and power tools. . . used on polishing heads, bench grinders, flexible shafts, etc. 3 sizes . . . capacities to 1/2". Models to fit 3/8-24, 1/2-20 and 1/2-24 threaded spindles.

ONLY

Jacobs Chucks

**Have The Rubber-Flex Collet
Its Parallel Bite Holds True and Tight**

THE JACOBS MANUFACTURING COMPANY

200 Jacobs Road, Hartford 2, Conn.

Please rush my copy of "19 Unusual Uses For Your Drill Press And Lathe". I enclose 10¢ for handling.

Name

Street

City.....Zone.....State.....

MARCH 1949 63

Don't Envy The PLUMBER-Be One

Make \$15 to \$50 a Day

Every skilled workman will tell you Plumbers have the best of it. WINTER and SUMMER the Plumber is busy at top wages. No skilled Plumber is ever out of a job. Compare his opportunities with any trade. To the man with know how, Plumbing means profit. Investigate Universal Plumbing School. Not a "war born school," but a plumbing school developed and operated by plumbers since 1923.



The Plumber
Protects
The
Health
of the
Nation

Own Your Own BUSINESS

Have your own business and big profits with little other than training and a kit of tools.

JOURNEYMAN Gets Good Salary

Master Plumbers own their own shop. A Journeyman works for a Master. With this training journey-men can depend on high wages.

G. I. Approved. Established 1923

UNIVERSAL PLUMBING SCHOOL
800 Holmes Kansas City, Mo.

BE A PLUMBER IN JUST 32 WEEKS

Learn With Tools—Not Books
No need ever serve an apprenticeship. Don't envy the plumbers big profits—enjoy them. Learn every trick of the trade—Leadwork—Blueprint for plan reading, etc. under Licensed Master Plumbers.

**Over 7,000 Successful Plumbers
Recommend This School**

This system has made more than 7,000 plumbers. Investigate our past performance. If you like to work with tools this is your opportunity. Become a Plumber in America's largest and only school devoted exclusively to plumbing. Write today for FREE information.

EARN MORE MONEY IN ELECTRICITY! with APPLIED PRACTICAL ELECTRICITY

Coyne's new set helps men get ahead in Electricity. This great Set gives you complete A to Z know-how. It's all explained in easy-to-follow language, hundreds of charts, examples, pictures. Covers practically all branches of electricity including appliance repairing; AC and DC equipment; electrical refrigeration; industrial electronics and much more. Brings you 10,500 electrical facts; 3,400 subjects; hundreds of wiring diagrams, tables, formulae, shortcut methods. Written and proved in the Coyne shops—backed by 50 years experience in electrical training that has put hundreds of electricians on the road to top earnings. **APPLIED PRACTICAL ELECTRICITY IS THE MOST COMPLETE ELECTRICAL SET IN AMERICA.**



Sent on
**FREE
TRIAL**

USE SET FREE FOR 7 DAYS!

You have to SEE these books to know how much they'll help you. See them FREE! Just fill out coupon below and mail it in. **SEND NO MONEY.** Examine the set for 7 days **AT OUR RISK!**

150 SHOP PRINTS BOOK FREE—FOR PROMPT ACTION



Act promptly and we will include FREE, our valuable new book "150 Shop Prints and How to Read Them." If you return the set at our expense in 7 days, you owe nothing. To keep Set, send either \$23.75 in cash or \$3.00 after 7 days and \$3.00 per month until \$23.50 is paid. *Either way, you keep the 150 shop Prints Book.* It's yours FREE! Coupon below is just a request to see APPLIED ELECTRICITY Set and to get FREE Shop Prints Book for doing so. Mail coupon **AT ONCE!**

FREE TRIAL COUPON—MAIL NOW!

Educational Book Publishing Division,
COYNE ELECTRICAL & RADIO SCHOOL,
500 S. Paulina St., Dept. 39-R8, Chicago 12, Ill.

YES! Send Coyne's new, 8 volume Set, "Applied Practical Electricity" to me, postpaid, for 7 days **FREE TRIAL** per your offer. Include, **FREE** of charge, your 150 Shop Prints Book.

Name.....Age.....
Address.....
Town.....Zone.....State.....



LOOK! WASH YOUR WINDOWS THIS SAFETY USE THE SAFETY WINDOW SEAT

SEND FOR ONE TODAY

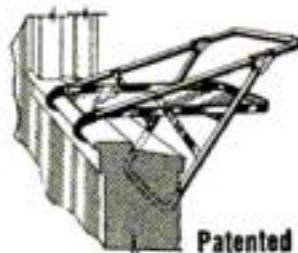
ONLY \$11.95 POSTPAID \$12.45 WEST of ROCKIES
NO C. O. D.

10 DAY MONEY BACK GUARANTEE

THE FAVRE MANUFACTURING CO.

183 WESTON ST. WALTHAM 54, MASS.

DESCRIPTIVE FOLDER ON REQUEST



Patented

Sand Casting—Forging—Heat Treating—Case Hardening BRONZE FOUNDRY



In your own workshop allows you to design and build your own GASOLINE ENGINES, STEAM ENGINES, STATUARY, ART OBJECTS, SPECIAL TOOLS, NEW INVENTIONS, ETC. You can also make forgings and case harden steel. Your shop is not complete without a FOUNDRYETTE. Three sizes are available capable of making bronze castings of 1½, 3 and 6 pounds weight, aluminum, copper, brass, etc., \$22.50, \$29.50, \$42.00 f.o.b. Kansas City. Domestic gas supply and 110 volt AC or DC energy required for operation. Write for circular.

KANSAS CITY SPECIALTIES CO.
Box 6022, Dept. S-2 Kansas City, Mo.

WIN with MAGIC CARDS



This special deck of playing cards with secret code on back of each card tells YOU what each card is when lying face down. Easy directions explain code and how to do many kinds of "Magic" tricks. Use same deck for usual card games, such as poker, bridge, etc. Only \$1.49. Get a deck today. **SEND NO MONEY.** Send Name and Address. Pay postman on arrival only \$1.49 plus postage. Address **HOLLISTER-WHITE CO., Dept. 455-M**

215 North Michigan Avenue, Chicago 1, Illinois.



SEND FOR THIS FREE!

Make money. Know how to break and train horses. Write today for this book **FREE**, together with special offer of a course in Animal Breeding. If you are interested in Galting and Riding the saddle horse, check here () Do it today—now.

BEERY SCHOOL OF HORSEMANSHIP
Dept. 583 Pleasant Hill, Ohio

TRAIN NOW FOR AN AVIATION CAREER IN SUNNY SOUTHERN CALIFORNIA

MAXIMUM TRAINING IN MINIMUM TIME

Specializing in AERONAUTICAL ENGINEERING and MASTER AVIATION MECHANICS since 1929... America's Finest Aeronautical Institute... 7000 successful graduates... **MAKE MORE MONEY... MAIL COUPON TODAY. APPROVED FOR VETERANS.** Board and Room now available.

Without obligation, send free catalogue with full information.

NAME.....AGE.....
ADDRESS.....
CITY.....ZONE.....STATE.....

CAL-AERO TECHNICAL INSTITUTE
GRAND CENTRAL AIR TERMINAL • GLENDALE 1, CALIFORNIA

You Need This -



FAMOUS CLEAR-VU DISPENSER

In your workshop, in the kitchen, in the garage — you and your family will find 1001 uses for this handy, time - saving dispenser for nails,

screws, washers, small tools, model parts, pins, buttons, spices—and hundreds of similar items. 16 transparent, 4-oz. screw-on glass jars mounted on red-enameled metal frame with bracket ready to mount to bench, wall, ceiling. Every home needs several. Over 50,000 already in use. Only \$2.25 complete—postpaid.

WORTH-MORE PRODUCTS COMPANY
Dept. A-3. 260 Columbia Ave. Elmhurst, Ill.



6 POWER TELESCOPE

WE PAY POSTAGE

Here it is! . . . just in time for Fall and Winter fun outdoors! Beautiful 6-power Telescope and at an amazing low price! NOT A TOY! Sturdily built of tough, ebony-like plastic. A beauty to look at—a thrill to look through. See the moon **SIX TIMES LARGER** than with the naked eye. See birds, wild life, scenery UP CLOSE from miles away. A once-in-a-lifetime buy! Order today! **SEND NO MONEY!** Just send name and address. Pay postman only \$1.00 plus postage on delivery. We pay postage if you send a dollar bill. -Hurry! Quantities limited - order now! Money back in 10 days if you're not delighted!

ELLIOTT PRODUCTS, Dept. C-11
2906 Fullerton Ave., Chicago 47, Ill.

EXTRA!

Beautiful, leatherette carrying case. Protects scope from rain, dust, dirt. Makes it easy to carry anywhere. Yours **WITHOUT EXTRA COST** if you order right away!



BRIGGS-STRATTON ENGINES

1 1/2 HP MODEL N—GOVT. SURPLUS

In good operating condition with 30 day written guarantee **\$39.50**

Prices FOB, K. C. No COD's

MIDWEST SALES CO.
2533 P INDIANA
KANSAS CITY, MO.



URANIUM DETECTORS



GEIGER COUNTERS
For Radioactive Mineral Prospecting

PRICED FROM \$59.50

Complete ready to operate

Write for complete information

ALPHA LABORATORIES
Box 184 Belmar, New Jersey

ELECTRIC SHEAR SHARPENER

Over 55,000 Sold—It Must Be Good!



Genuine Carborundum wheel ideal for shop or home use. Send remittance with order and shipment will be made at once, prepaid to your door, complete with electrical goods catalogue. Motor driven **\$9.75** complete with vise

WILLIAM MARVY COMPANY, Dept. 7
479 St. Peter Street St. Paul 2, Minn.

Provides PRECISION CONTROL..

because
FOREDOM #99
FLEXIBLE SHAFT
MACHINE with
PENCIL-SIZE
HANDPIECE..



KEEPS YOUR WORK WELL IN VIEW

35" FLEXIBLE SHAFT
\$15.95
COMPLETE WITH MOTOR

GRIND—POLISH—SAW—SAND
ETCH—ENGRAVE—ROUT—CARVE
MILL—CLEAN

Use on all metals, wood, plastics, glass, leather, linoleum, etc.

REMEMBER that in the precision-made FOREDOM you get MORE POWER—LONGER MOTOR LIFE because MOTOR IS NOT DWARFED TO FIT HAND. DOES HUNDREDS OF JOBS WITH MARVELOUS EASE because pencil-size handpiece gets into hard-to-reach places—provides positive, easy, precision control.

Profit by experience of many thousands of Foredom users—over a quarter century experience stands behind the product. Other heavier-duty models at proportionately reasonable prices.

No. 25 Accessory Set (a truly versatile assortment) \$5.50 extra. Also No. 999 Kit, comprises No. 99 Machine, illustrated, and set of 12 accessories, all in wooden case for only \$19.95. 6-step Foot Rheostat \$4.85. Over 70,000 Foredoms in use.

AND HERE'S ANOTHER AMAZING FOREDOM PRODUCT

Foredom PRESTO-FLEX
with PENCIL-SIZE Handpiece **\$5.95**



Now turn your old motor, drill press, or electric drill into a Flexible Shaft Tool. Simply attach to your electric drill, drill press or motor. Presto—a flexible shaft machine! Off again in a jiffy! Pencil-size handpiece gives you finger-tip control. Gets into tight places you can't reach with any other tool. Handy 35" overall length. And—only \$5.95 complete! Not to be confused with inferior imitations. Precision made, backed by 1/4 century experience in this field. All parts replaceable. Order NOW. If ordered for use on motor, specify motor shaft diameter and add 50c for coupling. (Available for 1/4", 5/16", 3/8", and 1/2" shafts.) No. 50 Accessory Set available \$1.50 extra. Order TODAY.

FOREDOM ELECTRIC CO., Dept. A-1015
27 Park Place, New York 7, N. Y.

Mail Coupon Now

Please send me FOREDOMS checked below on 10-day trial.

☐ Presto-Flex Tool (\$5.95) ☐ No. 50 Accessory Set (\$1.50)

☐ Motor Coupling (50c) ☐ No. 25 Accessory Set (\$5.50)

☐ Specify motor shaft diameter... ☐ Foot Rheostat (\$4.85)

☐ No. 99 Machine (\$15.95) ☐ No. 999 Kit (\$19.95)

☐ Send C.O.D. plus postage. I will pay postman. ☐ Free Catalog.

☐ I enclose payment. Send postpaid. (Money back either way if not delighted)

Name.....

Address.....

City.....Zone.....State.....

OFFICER'S PINKS

Quality Year Round Dress Trousers \$9.95 PR.

Beautifully tailored of finest ELASTIQUE material. Officers have to look well dressed. Fully guaranteed. Wrinkle-proofed to hold crease. Tailored for correct fitting, styling and comfort. **BRAND NEW!** Zipper front. Roomy pockets. Sizes 30-42 in assorted lengths. Sold thousands. Item now scarce. Order while supply lasts. **SEND NO MONEY.** Just name, address, size. Pay postman only \$9.95 (previously \$14.95) plus charges on delivery. Cash orders sent postpaid.

LEONARDS & LEE SURPLUS SALES
69-71-73 E. 75th St., Dept. O-103, Chicago 19

MARCH 1949 65

Bolex belongs..

acclaimed by
thousands as the
world's finest
movie camera



H-16
H-8

On vacation, around the home, in the scientific laboratory, on the production line — wherever the most critical performance is required — Bolex belongs. Expect the utmost from Bolex . . . expect extreme versatility, operational simplicity, trouble-free mechanism and superb pictures. Bolex will never disappoint.

BOLEX L-8 . . . "tops" in small double 8mm cameras. With suede carrying case, leather wrist strap, and uni-focus 12.5mm f:1.9 coated and color-corrected lens, \$119.50, including tax.



Bolex
The World's Finest

At All Good Photo Stores
or Write Dept. PS-3

AMERICAN BOLEX COMPANY, Inc.
521 Fifth Avenue, New York 17, N. Y.

AT LAST! FOLDING METAL LEGS FOR SAWHORSE, TABLES, PLATFORMS

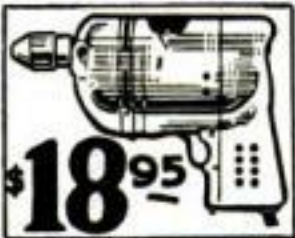


You can fold these legs up when you're thru using them! Get them out of the way. Light, strong, (support 1000 lbs.) Set up in seconds to any length. Alligator grippers, toggle lock bar, weather resistant. Ideal for supporting ping pong, work, display and picnic tables. Also for papering, painting, etc. Order now. State height wanted 24 or 30" tall. Leg set for 1 sawhorse \$9.95. Leg sets for 2 sawhorses \$11.95.



FAMOUS BLACK & DECKER PORTABLE ELECTRIC DRILL

Compact, powerful, easy handling, 110V AC or DC. Speedy 1/4" Jacobs 3-jaw chuck. "Trigger" switch locks "ON" if desired. Light, strong aluminum housings. Precision built, long wearing gears, pinions, bearings. Has 1000 uses in homes, Hobby Shop, Farms, or repair kit. A proved, famous make, yet costs less than unknown drills. Order Now!



\$18⁹⁵

Send \$2 deposit each item. Pay balance on arrival. Order now while then lost. Money back guarantee.
SKARIE CO., INC., Dept. 4
707 N. HOWARD ST. BALTIMORE 1, MD.



WAKE UP YOUR Scalp
WITH THE NEW
ELECTRIC-AUTOMATIC
Vitabrush

BE FAIR TO YOUR HAIR Want better looking hair? Embarrassed by falling dandruff, itching scalp? Get the new VITABRUSH, the electric-automatic brush with built-in brush head motor . . . gives scalp and hair an invigorating "workout" in just 3 minutes. Cleans scalp, stimulates blood supply, distributes the natural oils. Fun to use—relaxing. Write for satisfaction-guaranteed offer—today. Hershey Mfg. Co., 3768 Field Bldg., Chicago 3.

WATCH REPAIRING

\$\$\$ LEARN AT HOME \$\$\$

Watchmakers make big money. Many needed. We train you thoroughly at home in spare time. Personal training under experts. No previous experience necessary. Tools and 15-jewel watch part of course. Ten easy lessons. Write today for free literature.

ILLINOIS SCHOOL OF WATCH REPAIRING
2870 ELSTON AVE. DEPT. PS-3 CHICAGO 18, ILLINOIS

REAL SURPLUS VALUES EMERGENCY SUPPLY TANK



Fill at any gas station, 150 lbs. airs 5 flat tires. Inflates rubber boats. Use for touch-up spray jobs, tire service truck, air horns, dust out motors, machinery, etc.
Shatterproof 12"x24" stainless steel tank with carry handle, check valve, two feet hose and tire filling chuck. Only.

Price FOB, K. C. No COD's

MIDWEST SALES CO. 2533 P Indiana
Kansas City, Mo.

LAW FREE BOOK



Your FREE copy of "The Law-Trained Man" shows how to gain prestige and greater earnings through Blackstone home law study. All instruction material furnished including 18-volume Law Library written by 65 well-known law authorities. Lawyers, judges among our graduates. LL.B. degree. Low cost; easy terms. Write today.

BLACKSTONE COLLEGE OF LAW 225 N. Michigan Ave.
Dept. 123, Chicago 1, Ill.
A Correspondence Institution Founded in 1890



IT'S EASY TO
"Trim-it-Yourself"
with
CHROMTRIM
METAL MOULDINGS
The perfected metal trim for wall or floor linoleum and building materials. 6' lengths, 8 shapes, easy to cut and apply.

Send 10c for "Trim Ideas" 16 page booklet. Over 30 projects and remodelling suggestions on where and how to use CHROMTRIM. Hints on lino-laying.

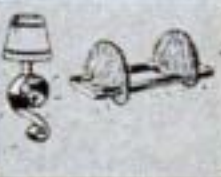
R. D. Werner Co., 291 Fifth Ave., N.Y. 16
Enclosed is 10c for CHROMTRIM "Trim Ideas" booklet P

Name _____
Address _____
City _____ Zone _____ State _____

REMODEL KITCHEN BATH - ATTIC



MAKE METAL
PROJECTS
with
CHROMTRIM



BE A SUPERVISOR



Franklin Technical Institute Helps Young People Get Ahead

• Specialized technical training opens wide the door to well-paid supervisory jobs in industry. 50,000 young men and women from many states have graduated from this

Boston school and found good jobs in engineering and technical fields.

Practical two-year day courses in industrial electricity and electronics, industrial chemistry, mechanical and machine design, structural design and architectural drafting, automotive service and management, electric wiring and maintenance. Also preparatory and evening classes. Approved for veterans. 41st year. Write for catalog.

FRANKLIN TECHNICAL INSTITUTE

Berkeley Street

Boston 16, Mass.

A REAL MIDGET RADIO!



CARRY IN POCKET OR PURSE

Works on new diode—NEEDS NO TUBES, BATTERIES OR ELECTRIC "PLUG-INS". Plays years for nothing! IN BEAUTIFUL RED PLASTIC.

GUARANTEED TO WORK
on local stations

SEND ONLY \$1.00 (bill, ck, mo) and pay

postman \$2.99 C.O.D. plus postage or send \$3.99 and we pay postage. **SENT COMPLETE, READY TO PLAY** on simple attachment. JUST THE MIDGET TO LISTEN AT HOME, IN BED, IN HOTELS, SCHOOL, MOST ANYWHERE ANYTIME! Wonderful gifts for anyone! Amazingly low-priced! Order Now!

MIDWAY CO.

Dept. TPS-3

KEARNEY, NEBR

NU-WAY LAWN MOWER

Write for
FREE Circular

Price **\$12.50**
Why Pay More



Build Your Own
Rotary Type Lawn
Mower

We Supply Cutting Unit
Complete.

**NO INCREASE
IN PRICE**

TRACTOR-LITE MFG. CO., SPIRIT LAKE, IOWA

WANTED PRACTICAL RADIOMEN

Your FCC license is the next Step Up!

Get your FCC Commercial "ticket" and get a better job with higher pay. If you have any practical radio experience, you can get your FCC Commercial license in a few short weeks, with CIRE simplified training and coaching. Send today for Free Booklet, "Money Making FCC License Information."

CLEVE. INSTITUTE OF RADIO ELECTRONICS

Desk PS-3

4900 Euclid Bldg.

Cleveland 3, Ohio



**YOU
can
draw!**

AMAZING NEW HOLLYWOOD PLAN

Yes, YOU can draw GIRLS, CARS, FRIENDS and even MAGAZINE COVERS. It's so simple, no matter what your age. Many artists make more than \$150.00 per week in advertising and cartoons. Be your own boss, draw for money anywhere. Our Commercial Artists will teach you the secrets from HOLLYWOOD. Drawing materials furnished. Be a success. Write NOW for free details

HOLLYWOOD SCHOOL OF ART

6533 Hollywood Blvd.
Hollywood 28, Calif.

Name _____

Address _____

City _____

Age _____

Zone _____

State _____



Make Stairwells Brighter... Safer WITH THE RIGHT ALUMINUM PAINT



FREE BOOKLET TELLS HOW. Gleaming aluminum paint covers darkened surfaces better... makes stairwells brighter, safer. For many other helpful painting hints, send for free 24-page book, "Paint It

Bright". Remember there is a difference in aluminum paints. For this job, get *Aluminum Metal & Masonry Paint*, from the dealer who displays this Alcoa symbol on the brand he sells. Address: Paint Service Bureau, ALUMINUM COMPANY OF AMERICA, 689 Gulf Bldg., Pittsburgh 19, Pennsylvania.



Look for this shield
on aluminum paints made by
many paint manufacturers using
ALCOA ALBRON PIGMENTS



**WAR
SURPLUS
BARGAINS**

**\$500,000.00 INVENTORY for
QUICK LIQUIDATION**

Surplus items—hundreds of them for home, shop, factory, farm and outdoor use. New items, used items, reconditioned items—all at tremendous savings—all priced for quick sale.

PAGE AFTER PAGE OF VALUES

This big catalog shows page after page of amazing money saving values. Write for your copy today. Send 10c to cover postage, mailing, etc. Write today!

SEND TODAY FOR YOUR COPY

STARK'S

509 So. State St.
Dept. PS-3
CHICAGO 5, ILL.

10c

She's some SMOOTHIE!
(YOUR CAR, THAT IS)

when equipped with

ADVANCE DEEP TONE MUFFLERS
(SINGLE STRAIGHT-THRU OR DUAL SET)
Rich, low, mellow tone. Also greater power, speed, and economy result from reduced back pressure. Rugged steel tube, blow-out proof. Simple to install. No welding. Dual set comes complete with rubber mounted clamps, fittings.

ADVANCE FENDER SKIRTS
Heavy duty steel skirts to beautify, streamline. Tight fit, no rattle, easy to install, prime painted.

KI-YI AND RAZZ HORNS
Get these novelty horns for laughs.

MAIL COUPON BELOW



ADVANCE MUFFLERS Dept. PS 3-9
6800 S. VERMONT AVE., LOS ANGELES 44, CALIF.

Send check, money order, or we will mail C.O.D. You pay postage upon receipt.

<input type="checkbox"/> Dual Muffler Set (Ford, Mercury only) .. \$20.00	<input type="checkbox"/> Single Muffler (other makes) \$5.50	<input type="checkbox"/> Fender skirts, pr. \$16.95
<input type="checkbox"/> Single Muffler (Ford, Chev., Plym.)... 4.86	<input type="checkbox"/> 2 1/2" Chrome tail pipe tips 1.75	<input type="checkbox"/> Ki-Yi Horn, each 3.25
<input type="checkbox"/> Send free catalog showing complete line.		<input type="checkbox"/> Razz Horn, each 3.25

Car make _____ Year _____ Model _____

Name _____

Address _____ City _____ State _____

HERE'S A NEW AND VITAL BUSINESS!

LEARN ELECTRICAL EQUIPMENT SERVICING



OFFERS BIG MONEY—INDEPENDENCE

Learn in spare time at home. NEW Shop Method Training System. Work as many hours as you wish—the Electrical Equipment Technician is his own boss. It is not unusual for a technician to charge on the basis of \$5.00 to \$6.00 an hour! Command big wages!

NO PREVIOUS EXPERIENCE NEEDED

We furnish everything! Tool kits, training kits, including the famous Christy trouble-detecting ELECTRONIC KIT. Plus illustrated instructions written in simple, easy-to-understand language, chock full of photographs and drawings. Shows you how to repair factory and household electrical units. Power machinery, refrigerators, washing machines, vacuum cleaners, irons, etc. Gives you a working knowledge of electricity, house wiring, motor winding, welding, nickel plating, etc. Shows how to build power tools you need, how to solicit business and what to charge. Many report paying for their entire course, tools, etc. on earnings made at home while learning!

FREE BOOK SENT TO YOU

Send your name for FREE booklet on Electrical Equipment Servicing and instructions for paying us later from your EARNINGS WHILE LEARNING!

CHRISTY TRADES SCHOOL
DEPT. D-7501 2835 N. CENTRAL AVE., CHICAGO 34, ILL.

NEW FLUORESCENT FIXTURE with CIRCLINE LAMP!



GUARANTEED FOR 1 YEAR!

A strikingly beautiful fixture in polished aluminum finish. Suitable for every room. Model C-32AP (illustrated), \$9.50. Model C-32S with etched glass shade, \$12. Sent POSTPAID anywhere in the U. S. upon receipt of cash order. C. O. D.'s sent F. O. B. factory. Write for free literature on full line.

\$8.95

HANOVER LIGHTING SALES
Box 186E, Dept. SC, Hanover, Pa.

POSTPAID

Command Bigger Money! STUDY LAW

STUDY AT HOME for BUSINESS SUCCESS and LARGER PERSONAL EARNINGS. 40 years expert instruction—over 114,000 students enrolled. LL.B Degree awarded. All text material furnished. Easy payment plan. Send now for FREE BOOK—"Law and Executive Guidance." It explains the course—how you may enroll and the many ways you may profit from Law Study. Write TODAY to:

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 12-PS, 646 N. Michigan Ave., Chicago 11, Ill.

SHORTHAND in 6 Weeks at Home

Famous Speedwriting system. No signs; no symbols; no machines; uses ABC's. Easy to learn; easy to write and transcribe. Fast preparation for a job. Surprisingly low cost, 100,000 taught by mail. Used in leading offices and Civil Service. Write for free booklet to:

Speedwriting
Dept. 2603-9, 55 W. 42 St., New York 18

GET THIS FINE SUIT NO MONEY TO PAY!



BIG CASH EARNINGS, TOO!

Big news! This fine tailored suit yours without paying one cent—and big cash earnings, too! It's easy! Just take a few orders. Earn up to \$10 in a day and get your own suit as extra bonus. Dozens of rich new fabrics, superbly tailored in latest styles, at low prices produce orders on sight. Money-back guarantee. **FREE SAMPLES!** Write today giving name, address, age, samples and details of amazing new BONUS SUIT and money-making plan—All Sent Free! No experience. **SEND NO MONEY!** W. Z. GIBSON, Inc. 500 S. Throop, Dept. Q-520, Chicago 7, Ill.

BUILD 3 Rm. HOUSE FOR \$500



Long lasting, good looking, insulating. Garages and barns built for as low as \$50.00 with our methods. 100 illustrations and 100 ways to save money and labor. Get this book before you start to build. Guaranteed, \$1.00.

SHEET METAL COTTAGES and other buildings. Several new methods. Illustrated instructions. 50c. **FURNITURE OF COMPOSITION.** Cement, sawdust, asbestos, etc., scrap wood, metal, etc. illus. 50c.

SHOP MACHINES FROM OLD AUTO PARTS: Over 60 described. 50c. **HOME MFG. ENTERPRISE.** 50 home shop projects. illus. 50c. **Special:** All five booklets described above, \$2.00 postpaid. **HOME INDUSTRIES,** 1116 So. 27th St., Dept. S-3, Omaha 5, Nebr.

Practical Shop Training

in

REFRIGERATION
AIR CONDITIONING

and/or

PRACTICAL ELECTRICITY
MAJOR APPLIANCES

Service, Maintenance, Installation

Train in
the Magic
City of
the South

Write for Details

COMMERCIAL TRADES INSTITUTE
202 SO. 20TH ST., BIRMINGHAM, ALA.

Veterans Inquire About GI Training

Member: Southern Association of Private Trade Schools.



**FIND OUT FREE—HAVE YOU
GOT WHAT IT TAKES...**

**to be a FINGER PRINT EXPERT
or TRAINED INVESTIGATOR?**

Send for free IAS Qualification Questionnaire. If in our opinion your answers indicate that you "have what it takes," then you will receive absolutely free the famous "Blue Book of Crime" . . . plus full details on how to train at home in Crime Detection and Finger Printing! IAS graduates are key men in over 800 Police Bureaus. See if YOU can train for this exciting, steady, "good pay" work! No obligation. No salesman will call. Write today, stating age.

INSTITUTE OF APPLIED SCIENCE
1916 Sunnyside Ave., Dept. X-1363, Chicago 40, Ill.

**WRITE
TODAY**

LEARN TO WRITE *a Good Hand!*

FOR BUSINESS AND SOCIAL SUCCESS!

Improve your handwriting at home quickly with my new instruction books just off the press. Master all the secrets of better penmanship. Simple and easy, fully illustrated, highly endorsed. Begin today. Write for: ☐ New Free Book, "How to Become a Good Penman", or check books wanted, \$1.00 each. ☐ Business Writing ☐ Artistic Writing ☐ Card Writing ☐ Engrossing Alphabets ☐ Bird and Design Flourishing ☐ Complete Set \$4.50 ☐ Enclose 10c for your name beautifully written and shading penpoint. S. A. Ziller, President, TAMBLYN SCHOOL OF PENMANSHIP 439 Ridge Bldg. In Business Over 52 Years Kansas City, Mo., U.S.A.

THEY'RE SUPER SCOPES!



36" 17 POWER

Extends to 36 inches. Precision and Polished Lenses. Ideal for Studying Stars, Plane Spotting, etc. Satisfaction Guaranteed or Money Refunded. Send Check or Money Order to

\$2.95
Post Paid

CRITERION CO., Dept. PS2

438 Asylum St.

Hartford 3, Conn.

INVENTORS

IF YOU WISH TO PROTECT YOUR INVENTION, You should take steps to protect it by a U. S. Patent. Write me for "Record of Invention" form.

CARL MILLER
REGISTERED PATENT ATTORNEY

Woolworth Bldg., 35th Floor, Dept. 39-C, New York City
Please send me "Record of Invention" form.

NAME.....

ADDRESS.....



**Put your future
in your own hands**

BE AN ARTIST

**Here's the Amazing
Way We Teach You
Step-by-Step to Draw
At Home in Spare Time**

Draw for money. Prepare yourself now for a fascinating, pleasant and profitable Art career. COMMERCIAL ART, DESIGNING, CARTOONING—all in one complete home study course. No previous art experience necessary. We teach you step-by-step and prepare you for good art jobs in advertising, newspaper and magazine publishing, department stores, printers, engravers, or in art studios, etc. You can become your own boss. For 35 years our graduates have been "making good"—WHY NOT YOU?

**Trained Artists Are Capable of Earning
\$65 - \$80 and MORE a WEEK**

Write for FREE BOOK, "Art for Pleasure & Profit"—tells about our course, instruction service, material furnished, what our graduates say, and commercial opportunities for you. TWO ART OUT-FITS and other features included with training.

VETERANS! Course G.I. Approved

FREE BOOK gives details!

Washington School of Art, Studio 133R
1115—15th St., N.W., Washington 5, D. C.

Please send me full information and your Free Book, "Art for Pleasure and Profit."

Name.....AGE.....

Street.....

City.....Zone.....State.....

☐ I am entitled to training under the G. I. bill

MEN: GET GOING IN A TRADE YOU LIKE!

Prepare for the great opportunities offered in AUTO BODY & FENDER REPAIR, DIESEL, REFRIGERATION, or AIR CONDITIONING. These big-paying fields are alive and growing—and so is their need for trained men. If you are mechanically inclined, you have a chance to prosper with the industry—perhaps have your own profitable business!

LEARN AT HOME IN SPARE TIME—You can keep your present job and learn in your spare time with practical, easy-to-understand U. S. I. training. Shop practice can be included. Methods proved by 21 years technical training experience; many successful graduates. High school diploma not necessary.

GET FREE FACTS NOW! Choose the field you like best. Check it above and mail this ad now for full information. No obligation. Better do it right now!

- ☐ Auto Body And Fender
- ☐ Diesel
- ☐ Refrigeration
- ☐ Air Con-ditioning



UTILITIES ENGINEERING INSTITUTE, Dept. M-1,
2525 Sheffield Ave., Chicago 14, Ill. Founded 1927

NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....

MARCH 1949 69

Do you want

→ ..to go to College?

→ ..or to enter a Profession?

(Such as Accounting, Architecture, Nursing, Dentistry, Teaching, Social Work, Osteopathy, Beauty Culture, Optometry, Embalming, Chiropody, Law, Medicine, etc.)

→ ..or get an Office Position?

To get anywhere, you practically **MUST** finish High School **FIRST**. You can complete our simplified High School Course in SPARE time at home, as FAST as your time and abilities permit. Equivalent to resident school work—prepares you for college, pre-professional examinations, business, industry. Standard texts furnished. Diploma. Credit for H.S. subjects already completed. Single subjects if desired. Low tuition, easy terms. American School, Chicago, est. 1897—endorsed by educators. Finish your high school education NOW. Write TODAY!

High School Course at Home

Many Finish in 2 Years

American School, Dept. H346, Drexel Ave. at 58th St., Chicago 37

Gentlemen: Send me FREE information covering special training in subjects checked below. No obligation on my part.

- | | |
|--|--|
| <input type="checkbox"/> High School Course | <input type="checkbox"/> Diesel Engineering |
| <input type="checkbox"/> Electronics, Industrial | <input type="checkbox"/> Drafting and Design for Men and Women |
| <input type="checkbox"/> Architecture and Building | <input type="checkbox"/> Plastics |
| <input type="checkbox"/> Automotive Engineering | <input type="checkbox"/> Private Secretary |
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Mechanical Engineering |
| <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Aviation |
| <input type="checkbox"/> Elec. and Gas Refrigeration | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Air Conditioning | <input type="checkbox"/> Radio |
| <input type="checkbox"/> Railway Training | |

Name

Address

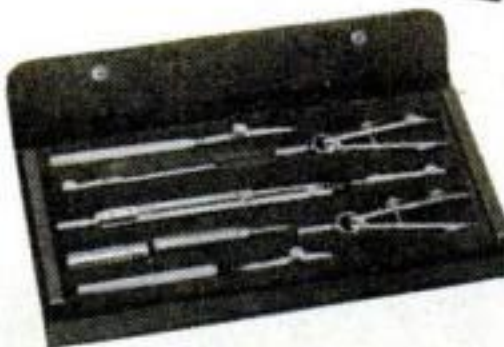
Get A Big Pay Job!

LEARN

DRAFTING

EASILY in SPARE TIME AT HOME

You Get FREE
This Professional
Set of Instruments
and complete
drafting equipment



IT'S EASY IF YOU
USE OUR SIMPLIFIED
TRAINING AND COACHING

We send you FREE complete drafting equipment including this professional set of drafting instruments. With this equipment and our proven methods of coaching and training you'll be ready for a big pay job in drafting in a few short weeks! Don't take chances with your future. Get into

Drafting now!

FREE personally supervised, specialized resident school training is available to graduates.



Get FREE 1949
Success Book

MAIL COUPON NOW!

CLEVELAND ENGINEERING INSTITUTE
PS-3, 2325 Chester Ave., Cleveland 14, Ohio
Send me your FREE 1949 Success Book showing how easy it is to GET A BIG PAY JOB in Drafting. ☐ Veterans check here.

Name

Address

City

State

NO OBLIGATION—NO SALESMEN

RADIO-AMPLIFIER STEEL CABINET



Handsome multi-use cabinet; made for RCA, beautifies any RADIO, AMPLIFIER or ELECTRONIC EQPT. Sloping dial (6 3/4" x 1 1/2") glistening CHROMIUM GRILLE & SIDE TRIM. Marine grey wrinkle finish. Overall: 16 1/2" x 9 3/4" x 10 1/2". Rubber legs. Shpg. wt. 10 lbs. BRAND NEW—WHILE THEY LAST \$1.98

110V. AC MOTOR—Approx. 1750 RPM. Shaded pole, fract. H.P. Quiet operating for Record Players, Fans, etc. 3/16" shaft. Overall: 2 1/4" x 2 3/8" x 1 1/2". Shpg. wt. 2 lbs. \$1.29

RADIO PARTS "GIANT GRAB-BAG"—This new JUMBO RADIO PARTS KIT is the YEAR'S BEST BUY—in new & dismantled Radio & Electronic parts.—17 FULL POUNDS or RESISTORS, CONDENSERS, WIRE, SOCKETS, HARDWARE, KEY, HEADBAND plus DOZENS OF OTHER ITEMS. All these (shpg. wt. 21 lbs.) for ONLY \$2.95

HEADPHONES (Army HS-23)—High impedance type. Adj. leather double band. Complete with cord, plug & rubber cushions. SPECIAL 1.25

LEOTONE

Min. order \$1.00
20% Deposit req. on COD's
Please add sufficient postage
65A DEY ST.—N. Y. C.



VETERANS
training is FREE
under G. I. BILL.

Learn WOOD PRODUCTION ENGINEERING

GET THIS FREE BOOK Today

It tells you how you can learn to become a successful WOOD PRODUCTION ENGINEER... by the Klok Home Study Correspondence Method... or by studying here in Grand Rapids in our Resident School... Training in WOOD PRODUCTION ENGINEERING offers you great opportunities... either to get a top position or to operate your own plant successfully. The Klok Course teaches you SKETCHING, ROD-MAKING, DETAILING, STOCK BILLING, TIME STUDY, COST and MANAGEMENT. WRITE FOR FREE BOOK TODAY! State preference whether Home Study or Resident course, with name, age, occupation and if veteran.

KLOK INSTITUTE
Peninsular Bldg.
GRAND RAPIDS, MICHIGAN



PRECISION JEWELERS SCREW DRIVERS

Complete Set of 8 for Every "Hobbyist"



AT LAST— a complete set of precision screw drivers to meet the needs of every model builder. Not a miniature but the same type set used by U. S. Navy for precision instruments and watches during the war. Brass knurled handles, hexagon heads, finest tempered steel blades. Sizes 2-9. Never before at such a low price. and precision back if not satisfied. Your money back if not satisfied. C.O.D. \$2.00 plus postage or send \$2.00 and we pay postage.

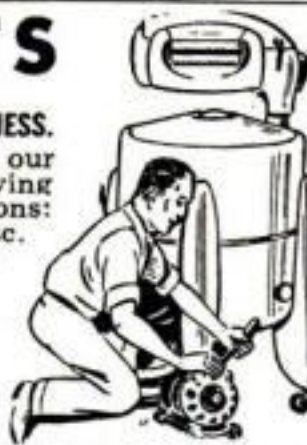
PINE WATCH CO., Rm. 40, 29 Eldridge St., New York 2, N. Y.

REPAIR PARTS

START YOUR OWN WASHING MACHINE REPAIR BUSINESS. Tremendous field, excellent profits! Get our large complete wholesale catalogue showing thousands of repair parts illustrations: wringer rolls, V-belts, motors, gears, etc. Price \$1.75 per copy, postpaid in U. S. Send check or money order today—price of catalogue refunded on first order.

Established 20 Years

WESTERN APPLIANCE CO., Inc.
5650 Grand River Ave., Detroit 8, Mich.



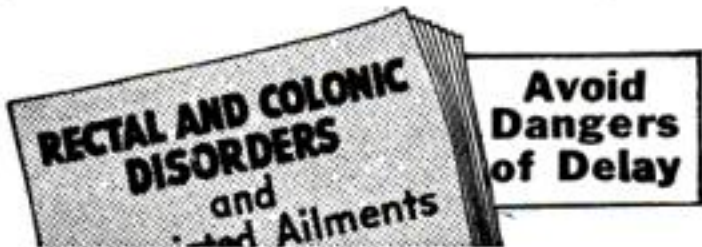
' ' PLASTICS ' '

Work in a fascinating and profitable hobby. Just out—our latest fabricating manual. Tells you how to work with Plastics. Our new Catalogue provides all needed materials: Plexiglas—Lucite—Fenite—Catalin—Acetate—all in sheets, rods, and tubes. Complete line of cements, dyes, accessories and supplies. Send 20c today for 1949 Catalogue and Handbook.

HOUSE OF PLASTICS

8648 Linwood Avenue Dept. MO 3 Detroit 6, Michigan

FREE BOOK—on Rectal Troubles



Here is good news. This 160-page, up-to-the-minute book on Piles, Fistula and other related rectal and colon ailments—will be sent free for the asking. It may save you much suffering, time and money. Write today—McCleary Clinic and Hospital, 371 Elms Blvd., Excelsior Springs, Mo.

Learn How to HYPNOTIZE!



Develop your personal POWER!
NOW...revealed for you...are the secrets of **practical hypnotism**... that strange, compelling force by which an expert operator can bring others under his power. He can **sway** people at will—issue commands and be obeyed—virtually cast a **spell** over his subjects. This sensational knowledge may make you a more dominant, masterful personality. **Illustrated SELF-INSTRUCTION COURSE in Useful Hypnotism** Amazing lessons in simple, easy-to-understand language. How to select a subject—how to hypnotize by telephone—**how to make money** from hypnotism—mental telepathy—stage hypnotism—self-hypnosis—how to use modern hypnotism to conquer inferiority complex, timidity, etc. Clear helpful pictures show operating positions, movements. **Starting low price. Satisfaction guaranteed or money back.**

COMPLETE ONLY \$1.95
SEND NO MONEY! Simply pay postman \$1.95 plus C. O. D. postage—or send \$1.95 and we pay postage; same money-back guarantee. Order "Hypnotism Course" today! Nelson-Hall Co., 1139 S. Wabash Avenue, Dept. 2-CI, Chicago 5, Illinois.

Have an OFFICE of YOUR OWN!

LEARN NEW PROFITABLE PROFESSION
At Home in 60 Days, Men & Women, 18 to 70!

Earnings of men and women in this profession run as high as \$5,000-\$15,000 yearly. Others make good money in spare time. Little money needed to start. A business where your earnings begin sooner. Easy to learn. No selling or goods to buy. No experience necessary. A depression-proof business. A course of action to guide you step by step as you earn. All 53 lessons sent at once to use as operating manuals. Easy terms. Diploma. Money-back agreement. Write for **FREE BULLETIN**.



FRANKLIN CREDIT SCHOOL
Dept. 71-C ROANOKE 7, VIRGINIA

CARBURETOR TOO RICH MAKES MOTORIST TOO POOR



Car owners who are wasting money and not getting proper gas mileage due to over-rich mixtures will be pleased to learn how to save gasoline by **VACU-MATING** over-rich mixtures. **VACU-MATIC** fits all cars, trucks and tractors. It is automatic and operates on the supercharge principle. Easily installed in a few minutes.

SALESMEN WANTED! Big Profits!
Send name, address on penny postcard for free particulars and how to get yours for introducing.
VACU-MATIC CO., 7617-1481 W. State St., WAUWATOSA, WIS.



FREE Catalog
Many New Items

HEADQUARTERS FOR SHOP EQUIPMENT

HEAVY DUTY FOR PROFESSIONAL WORK IN YOUR HOME SHOP
PRECISION MILLING TABLE for professional work on home shop drill press or other shop equip. Table 7½" x 7½". T. slot machined for ¾" bolt, ½" lead screw, acme thread Bronze nut—slide travels 6", has two ¾" mounting holes. **FINEST QUALITY—wt, 20 lbs. SENT POSTPAID for only \$19.00. Other Models to \$67.00.**
With **BROWN CONVERTER** Drill press has a 1000 uses. **SLOTING, DIE FILING, SAWING, ETC.** 1" STROKE—sealed ball bearings—Durametal housing. Long wearing, only 3 moving parts complete with adapting spacer. State make, model of Drill press when ordering. Sent Postpaid only **\$23.00.** 1¾" stroke Model \$31.00. **Money back guarantee.**

DIRECT FACTORY PRICES — ORDER YOURS TODAY
LEO G. BROWN ENG. CO., 1531 S. SUNOL DR., LOS ANGELES 23, CALIF.



O.D. WOOL SHIRTS
13 to 15
269
PANTS
28 to 34
295

Perfect condition, designed for reissue. All have been cleaned and pressed by the Q. M. Corps. 100% all wool serge. Priced less than the cheapest work clothes. Add 12c postage per garment.

BRAND NEW KHAKI SHIRTS-PANTS
14 to 17
299
28 to 42
379

NEW. Neatly tailored of 8.2 chino khaki suntan material. Shirts have 2 button-down flap pockets. pants have cuffs. Add 10c postage per garment.



ARMY STYLE 688 COMBAT BOOTS

NEW. For sportsmen and outdoor wear. 10" high. Reversed uppers, full oak leather sole, with composition outer sole. Add 27c post.

WAR Surplus

AND OTHER OUTSTANDING BARGAINS—ORDER FROM THIS AD. IT OFFERS ADDED SAVINGS.

NAVY STYLE FIELD SHOES
NEW. Rugged, comfortable. Reversed uppers, full oak leather inner sole, extra composition outer sole. Add 22c post.



PARA TROOPER BOOTS
\$9.95 SIZES 6-12
10" High — Uppers Brown Elk, Goodyear Welt, Oak Leather Sole, Extra Composition Tap Sole. Add 27c post.

NYLON PARACHUTE CORD

NEW. Ideal for clotheslines, drapery and venetian blind cords. 550 lbs. tensile strength. 3/16" diameter. Add 7c postage. **50 FT 59c**

OFFICER STYLE OXFORDS
695
• BROWN
• BLACK
NEW. Finest quality uppers, best oak bend leather outer sole. Half leather lined. Add 20c post.

ORDER FROM THIS AD

NAVY T-SHIRTS WHITE
59c
NEW. Combed yarn, full cut, small, medium, and large. 5c postage.

BARGAINS
● **50% WOOL HOSE**..... 39c
NEW. Medium weight, rugged and warm. Post. 3c.
● **63% CUSHION FOOT HOSE**..... 49c
NEW. 63% wool, double sole. These are known as the desert sox, Khaki and white. Add 4c post. per pair.
● **B-15 AVIATOR'S JACKET**..... 12.88
Renders greatest warmth per oz. of weight. Mountain cloth outside, pile lined body and sleeves. Genuine mouton collar. 4 pockets—2 outside, 2 inside. Wool knit cuff and waistband. Add 27c postage.

MAIL ORDERS Please send remittance with order. Include postage. Guaranteed Satisfaction.

SIoux FALLS SURPLUS STORE

SIoux FALLS, S.D. **SEND FOR FREE War Surplus CIRCULAR**

Save Your Car and Your Temper with a HULL AUTOMOBILE COMPASS

Wrong turns mean lost miles, time and driving pleasure. Be right, every time, with a Hull Automobile Compass. **Beaconlite** illuminated, **\$5.95.** **Streamline** standard, **\$3.95.** At your dealer's. Write for literature.
HULL MFG. CO., P. O. Box 246-E3, Warren, Ohio



Drill Press Converter.



WAR SURPLUS OPTICAL BARGAINS ASSEMBLE YOUR OWN BINOCULARS!

Save More Than 1/2 Regular Cost



GOVERNMENT'S 7x50 BINOCULARS

Complete Optics!
Complete Metal Parts!
We supply Full Instructions

METAL PARTS—Set includes all Metal Parts—completely finished—for assembly of 7 X 50 Binoculars. No machining required. A sturdy Binocular Carrying Case is optional with each set of Metal Parts.

Stock #842-N \$39.40

Postpaid, plus \$4.80 for Case—Total..... \$44.20

OPTICS—Set includes all Lenses and Prisms you need for assembling 7 X 50 Binoculars. These are in excellent condition—perfect or near-perfect—and have new low reflection coating.

Stock #5102-N..... \$25.00 Postpaid
(These are standard American-made parts... not Japanese, French or German.)

NOTICE! If you buy both Binocular Optics and Binocular Metal Parts, add 20% Federal Excise Tax to above prices.

ARMY'S 6x30 BINOCULARS

COMPLETE OPTICS & METAL PARTS—Model M-13A1, 6 x 30 Binoculars (waterproof model). Everything you need—ready for assembly. When finished will look like a regular factory job costing \$102 to \$120. The Optics are new, in perfect or near-perfect condition. Have new low reflection coating. Metal Parts are new and perfect, all completely finished. No machining required. Complete assembly instructions included.

Stock #830-N..... \$40.00 Postpaid, plus \$8.00 tax—Total—\$48.00

20X PRISM SPOTTING SCOPE SET—Consists of all lenses and prisms (slightly chipped) you need to make a good, standard 20X Spotting Scope. Low reflection coated. 57 mm. dia. Achromatic objective. Some metal parts included. We furnish directions.

Stock #5145-N..... \$22.00 Postpaid
(Also surplus Riflescopes—Write for Bulletin "N")

SLIDE PROJECTOR SETS—Consist of all unmounted lenses you need to make the following size projectors:

Stock #4038-N—2 1/4" x 2 1/4" \$3.35 Postpaid

Stock #4039-N—2 1/2" x 3 1/2" \$3.35 Postpaid

Stock #4029-N—35 mm. \$2.85 Postpaid

MOUNTED ANASTIGMAT LENSES—Use for Projectors, Enlargers, Copying Cameras. Complete with Shutter and Diaphragm. Value about \$20. An excellent buy. WE WILL INCLUDE FREE ILLUSTRATED BOOKLET on HOW TO MAKE YOUR OWN ENLARGER.

Stock #8004-N—Speed f/7.7, focal length approx. 127 mms. Suitable for pictures, negatives, positives up to 3 1/2" x 4 1/4" \$7.50 Postpaid

Stock #8006-N—Speed of f/7.7, focal length approx 100 mms. Suitable for pictures, etc. up to 2 1/4" x 3 1/4" \$8.50 Postpaid

35MM KODACHROME PROJECTING LENS SET—Consists of a mounted projecting lens, heat absorbing glass, 2 condensing lenses

Stock #4035-N..... \$4.85 Postpaid

We have millions of war surplus lenses and prisms at bargain prices ranging 10c and up. Write for Catalog "N"—Sent Free!

Order by Stock No. Satisfaction Guaranteed

EDMUND SALVAGE COMPANY

P. O. AUDUBON, NEW JERSEY



Pants Prices DOWN!

SAVE \$4.55

\$12.50 VALUE, Only \$7.95

Genuine Gabardine Dress Trousers. Finest virgin wool and fine-spun rayon blended. Twill weave resists wrinkles, holds crease, gives amazing wear. Expert fashion tailored for perfect fit. Zipper front. Roomy pockets. Blue, Tan, Sand, Lt. or Dk. Brown, Blue-Gray. Waist sizes: 28-38 pleated, 28-50 plain. **SEND ONLY \$1** with name, waist size, 1st and 2d color selection. Pay postman balance or send full price, save postage. Money back if not pleased.

More sales people wanted. Order a pair—get big profit offer.

LINCOLN TAILORS Dept. PS-3 Lincoln, Nebr.

BUILD and repair 'em YOURSELF

with **PEMCO** wheels
TOYS & CARTS
SCOOTERS
TRICYCLES
IMPLEMENTS

Portable FURNITURE
GARDEN GRILLS
AIR COMPRESSORS
SHOP EQUIPMENT



COMPARE THESE REDUCED PRICES!

SEMI-PNEUMATIC—LOAD TESTED

6" x 1.50", Oilite Bearings \$1.35 each
8" x 1.75", Ball Bearings 1.85 each
10" x 1.75", Ball Bearings 2.20 each
10" x 2.00", Ball Bearings 2.50 each

DEALERS AND QUANTITY BUYERS—WRITE FOR SPECIAL PRICES!

PARAMOUNT ENGINEERING & MFG. CO.
1872 RAVINE ROAD, KALAMAZOO, MICHIGAN



SEE!

"IT" FREE

the eye appealing
Color Slide "Vi"
"THE DESERT DANCER"

SEND 10¢ IN COIN OR STAMPS
TO COVER HANDLING COSTS. TO.

STORE... 6411 HOLLYWOOD BLVD.
HOLLYWOOD 38 CALIFORNIA

Guaranteed by mfr. for FULL YEAR

Handsome Swiss wrist watch...

Marvelous value in a good-looking watch, built by skilled Swiss craftsmen. So well-made that a printed one-year guarantee is given. Has sweep second hand, glow-at-night dial, rugged chrome case, unbreakable crystal. Timed and tested movement; leather strap.

Send no money—10 day trial
Pay postman \$6.95, plus
tax and postage (or
send check and we pay
postage). Return in 10
days, if not delighted.

Swiss Watch Distr.
211 Paramount Bldg.
(Dept. 903-B) Atlanta, Ga.



MONEY for MEN ALL DATA FREE

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble Imitation. Experience unnecessary. 1/2c material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. Big chain store orders now being placed. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N. Y.

ENGINEERING DEGREE IN 27 MONTHS

INDIANA
TECHNICAL
COLLEGE

Aeronautical, Chemical, Civil, Electrical, Mechanical, and Radio Engineering (Inc. television). Drafting, 1-yr. Gov't approved for G.I.'s. Low rate. Earn board. Large industrial center. Students from 48 states, 18 countries. Demand for graduates. Enter March, June, September, December. Catalog.

639 E. Washington Blvd., Ft. Wayne 2, Ind.

NOW YOU TOO CAN BUILD 15 RADIOS

**Absolutely no Knowledge
of Radio Necessary
You Need NO Additional Parts**

The PROGRESSIVE RADIO KIT is THE ONLY COMPLETE KIT. Contains everything you need. Instruction Book, Metal Chassis, Tubes, Condensers, Resistors and all Radio parts.

The 36-Page Book written by Expert Radio Instructors teaches you to build radios in a Professional Manner. You start with a 1-tube receiver. Before you are done with this kit, you will have built 11 Receivers, 1 Public Address System and 3 Transmitters.

SPECIAL FREE OFFER!

Electrical and Radio Tester sent absolutely FREE with each Progressive Radio Kit. PLUS FREE membership in Progressive Radio Club. Entitles you to free expert advice and consultation service with licensed radio technicians.

Write for further information, or ORDER your **KIT NOW! ONLY \$14.75**

Postage prepaid with check or money order.

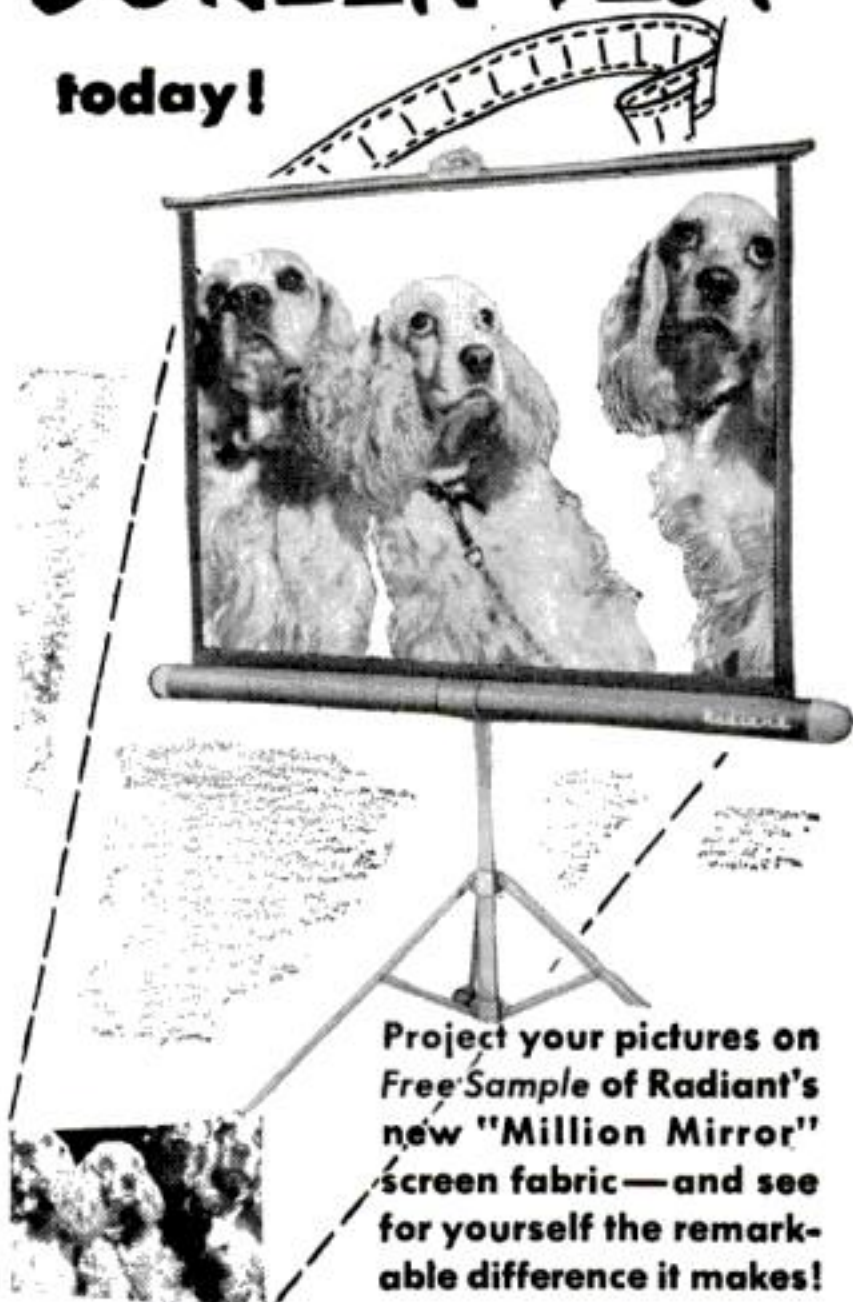
(Postage not prepaid with C.O.D. orders)

PROGRESSIVE ELECTRONICS CO., Dept. 106
497 Union Avenue Brooklyn 11, N. Y.



Make this amazing **FREE** "SCREEN TEST"

today!



Project your pictures on Free Sample of Radiant's new "Million Mirror" screen fabric—and see for yourself the remarkable difference it makes!

See how millions of tiny glass mirrors, firmly imbedded in the pure white screen surface, make your pictures fairly glow with life! See what happens when light is *reflected* instead of absorbed! You will enjoy clearer, sharper black and whites—richer, brighter, more brilliant colors. Here is projection as real as life itself! The new 1949 Radiant Screens have many unusual exclusive features. Prices as low as \$12.50.

Write today and get absolutely FREE

a sample of the new Radiant "Million Mirror" Screen Fabric ALSO a copy of the *Basic Film Source Directory* your guide to film sources.

RADIANT MANUFACTURING CORP.

1259 South Talman Avenue Chicago 8, Illinois

**MAKE
YOUR OWN
JOINTER
WITH
LEWIS
CASTINGS!**



THIS HEAVY DUTY LEWIS JOINTER planes, rabbets and produces excellent surfaces on all work up to 6" wide! Castings available rough or semi-finished. Build it yourself and save!

SEND 10c FOR 32 PAGE CATALOG—
Showing all Lewis Power Tool Projects

LEWIS MACHINE TOOL CO. P.O. Box 7446, Sta. L, Dept. S,
Los Angeles 23, California

SWISS MUSIC MOVEMENTS



For Easter make musical toys and novelties or make your old toys and novelties new with these fine imported units. Wide variety of Christmas, nursery, popular, folk and waltzes. 1 tune movement only 82.25 postpaid. Short time only special 2 tune waltz movement, plays 5 minutes, postpaid. **\$3.50**

SEND FOR FREE TUNE LIST—MAKE MUSICAL TOYS FOR PLEASURE AND PROFIT

MARITIME — 13 East 60th St. — New York 22 — New York

BARBELLS



95 POUND SET

Only \$10.80

Extra Plates 10c pound

We have been selling the finest barbell equipment since 1928. We operate our own foundry and sell direct to you at a very low profit. No other company can match our low prices.

Send for our **FREE**
Catalog.

BUR BARBELL CO.

319-D Orient Way
Lyndhurst, New Jersey

MARCH 1949 73

Classified Ads only 80c per word per insertion, payable in advance. Minimum ad 10 words. To be included in May issue, copy should be in our office by March 22nd. May issue on sale May 1st.

CLASSIFIED OPPORTUNITIES

POPULAR SCIENCE MONTHLY-351 FOURTH AVE.-NEW YORK CITY 10

1 AUTOMOBILES

HOW To Build Racing Car Book. New revised, complete mechanical data, big cars, midgets, hotrods, 50 photos, drawings, charts, \$2.00 postpaid, Clymer, Dept. B-NRB, 1268 So. Alvarado, Los Angeles 6, Calif.

RACING Car Equipment for all cars. Engines, Racing Heads, Manifolds, Carburetors, Mufflers, etc. Speed instructions and literature \$1.00—refunded first order. Lee Motorcraft Co., 1412-B Great Northern Bldg., Chicago 4, Ill.

MODEL "A" and "T" Ford Book. 572 pages, complete information repairing, maintenance, servicing both models and Fordson Tractor, \$3.50. Model "A" book only \$1.00 postpaid, Clymer, Dept. B-ATA, 1268 So. Alvarado, Los Angeles 6, Calif.

FROM Speedway to Roadway! Track-proved Hi-speed Heads and Manifolds now available for your passenger car! No special tools needed! Increase horsepower 25%! Astounding getaway! Free illustrated catalog. Speedsport, 6215AB Diversey, Chicago 39.

CLYMER'S Test Reports on Post-War Kaiser-Frazer, Studebaker, 1949 Ford, 1949 Mercury, gives impartial, uncensored report 3000-mile economy, speed, record tests. Part-by-part equipment analysis. 3,000 owner tabulations in each book, 200 owner letters, Good, bad comments about each make, no punches pulled. Learn the truth. Specify make car interested in. \$1.50 postpaid, Clymer, Dept. B-TR, 1268 So. Alvarado, Los Angeles 6, Calif.

CALIFORNIA custom styling headquarters. Buy direct from original designers and save. Solid hood sides, lowering kits, grille panels, fender skirts, dual pipes, speed equipment, chrome motor accessories. 24 page picture catalogue with scores of beautifying accessories—25c. Eastern Auto Supply, 331D South Grand, Los Angeles 7, California.

NEW Hot Rod Book. Revised 1946-47-48 cars, 125 photographs, descriptions, California Dry Lake Speed records, \$1.50 postpaid, Clymer, Dept. B-3NV, 1268 So. Alvarado, Los Angeles 6, Calif.

AUTOMOBILE Racing Book. Fifth edition-revised. Tells how to build dirt tracks, bodies, frames, engines, Records, superchargers, rules, formulas, plans, stock conversions, roadster racing, fast Fords, \$1.00 postpaid, \$1.15 C.O.D. Ray Kuns, Department 274, Madisonville, Cincinnati, Ohio.

OUTBOARD Motorboating Handbook. 252 pages, 89 charts, drawings. Complete service information every make outboard. Greatest outboard book ever. Just published. \$3.50 postpaid, Clymer, Dept. B-OM, 1268 So. Alvarado, Los Angeles 6, Calif.

AUTOMOBILE Racing. Sixth Edition. 100 illustrations. Working drawings with building instructions for Ford-60 midget, California roadster, Offenhauser racer. Details on racer parts. Sample entrance blank. World's record 158.5 M.P.H. rear engine four-wheel drive car. Interesting information for fans, drivers, mechanics. \$2.00 postpaid; \$2.25 C.O.D. Ray Kuns, Department 62, Cincinnati 27, Ohio.

CLYMER Crash Helmet. Finest model with visor \$25.00. Catalog free, Clymer, Dept. B-CH, 1268 So. Alvarado, Los Angeles 6, Calif.

BUICK Parts. We stock a complete line of new Buick parts and engines. Same day service on orders and inquiries. We ship anywhere. Write today. Robertson Buick Co., 1002 S. Wabash, Chicago 5, Ill.

STEAM Automobile Books. Clymer's Steam Scrapbook 224 pages, 100 steam cars illustrated, described, \$2.00. Modern Steam Car Book \$2.00. Original catalog reprints Stanley, White, Doble \$1.00 each postpaid. Specify title wanted, Clymer, Dept. B-SS, 1268 So. Alvarado, Los Angeles 6, Calif.

DUALTONE Crystalline packed California mufflers for all automobiles. Large chrome tailpipe extensions. Chromed carburetors, fuel pumps, long shackles, dual manifolds, hi-compression heads, flywheels, camshafts, fender skirts, Plexitops. Send 20c illustrated catalogue, deduct from first order. Streamlining Manual \$2.00. Dualtone mufflers, 2636B India Street, San Diego 1, California.

CLYMER'S 1948 Indianapolis Race Year Book. Complete information, 100 photographs, charts, drawings, cartoons, \$1.50. DeLuxe Fabrikoid bound \$2.50 postpaid, Clymer, Dept. B-548, 1268 So. Alvarado, Los Angeles 6, Calif.

RACE Car Photographs. Over 1200 Different. Catalog Sample 25c. Frank Smith, Watson St., Paterson, New Jersey.

HIGH Compression heads, V-8. More speed, acceleration, power. Offenhauser or Edlebrock \$75.00 complete set. Dual manifolds complete with throttle kit, fuel lines. Edlebrock \$49.00. Offenhauser \$55.00. Give make, model V-8. Catalog 10c. Clymer, Dept. B-33, 1268 So. Alvarado, Los Angeles 6, Calif.

"VAPO-Steamatic" Water Injection. Easily built (almost no cost). Finest automatic "Moist-Humidity" system. Engineering triumph—up to ten more miles per gallon! Tremendously increases horsepower! Eliminates ping, carbon, overheating. Reduces wear—lengthens engine life! Copyrighted "Installation Handbook"—including completely illustrated plans, diagrams, instructions—\$1.00 postpaid. Newhouse Automotive Industries, 5941-A Hereford, Los Angeles 22.

CLYMER-TONE. Twin Muffler sets, beautiful sound, complete with necessary welded pipes, E-Z installation, Ford V-8, \$20.00. Chevrolet set with split manifolds, \$37.50. Specify car model, Clymer, Dept. B-34, 1268 So. Alvarado, Los Angeles 6, Calif.

"SPEED And Power" Handbook—Very latest methods! Build your own Dual Manifolds, "Superchargers", Water Injectors. Hi-Compression Heads, Fuel Saving Devices—easily. Save many dollars! Get racing speed, acceleration, dynamic power increases from any automobile! Build fast stock cars! California Roadsters! Hotrods! Get ingenious formulas! Speed secrets! Illustrations! Conversion ideas! Also "Economy Information"—Mileage tricks! Tuning techniques! Picture catalogues, including "California Restyling Ideas"—Glossy photographs! Drawings! Model revising! Customizing! Streamlining!—\$1.98 complete. Newhouse Automotive Industries, 5941-A2 Hereford, Los Angeles 22.

INTERCHANGEABLE Parts Book. New book tells every automobile part that interchanges with others. Same parts many times vary 100% in price. This book enables garages, mechanics, dealers, owners to buy under cheapest listing. Tremendous savings for users, \$15.50 postpaid, Clymer, Dept. B-IP, 1268 So. Alvarado, Los Angeles 6, Calif.

SEE our ad under motorscooters for Midget Car bargains. Midget Motors Directory, Athens, Ohio.

MOTORBIKE outfit \$5.00; Midget car (complete) \$35.00; Indian Motorcycle \$30.00; Cushman motorscooter (complete with extra tire) \$20.00; 1946 Whizzer \$35.00; other motorscooters \$10.00 up; motors \$3.00 up. Send 25c for new catalog #942 listing many other sensational bargains in used motors, motorscooters, motorcycles, parts, etc. Associated, Box 1764-CS, Toledo, Ohio.

WHIZZER Bike-motor \$25.00; Cushman motorscooter \$15.00; Midget Racer \$40.00; Shaw Bicycle-motor \$15.00; Harley-Davidson Motorcycle \$15.00; Smith Motor-wheel \$25.00; Good motorscooter (twist grip) \$22.50. Rush 25c for new catalog #13 listing many other amazing bargains in motorscooters, used motors, midget cars, parts, wheels, etc. Gail, 538 Erie, Toledo, Ohio.

FAMOUS Car catalog reprints. 1949 Alfa-Romeo, 1949 German Volkswagen, 1949 Italian Maserati Racing and new Sport car, 1949 rear-engined Isotta-Fraschini V-8, Rolls-Royce "Silver Wraith", Duesenberg Supercharged, Mercedes-Benz, Miller Race Cars, Cord, Rayfield Cyclecar, V-8 Chevrolet, Stanley Steamer, Doble Steamer, 1916 Metz friction driven, 1912 Ford. Specify catalog desired, \$1.00 each postpaid, Clymer, Dept. B-3X, 1268 So. Alvarado, Los Angeles 6, Calif.

CARBURETION for Car Owners. New Simplified illustrated pamphlet shows the way to better mileage, performance. Stop stalling, flooding with simple home adjustments \$1.00. Carburetor Specialist, 501 N. Parramore Street, Orlando, Florida.

FORM Speed Manual just off the press! Guaranteed finest speed manual you can buy! This book contains the information you need to hotrod any Ford V-8, Mercury, Ford Six, Model A, Lincoln-Zephyr. Filled with photographs, Cutaway drawings by Medley explaining installation of hydraulic brakes on any year Ford. How to install V-8 engine in Model A. All expert, proven data which you can use! California Bill, Box L-2, Eaglerock, Los Angeles 41, Calif.

CHEVROLET Speed Manual for Chevrolet owners desiring real hotrod performance from their 1937 to 1948 Chevrolets. Filled with photographs, complete information, proven methods. How to make your road car capable of 100 mph plus! How to build Chevrolet hotrod engines for road, track, or marine use. California Bill, Box L-2, Eaglerock, Los Angeles 41, Calif.

CUSTOMIZE Your Car! Authentic California restyling plans galore! Working sketches, specific model changes. Comprehensive; complete! 130 photographs! Largest, finest or refund! Includes accessory catalog! \$2 pp. Post Publications, Box 723-MC, Arcadia, Calif.

MAKE your car go! Hot-Rod Manual \$1.50. Speed Parts list 25c. Hot-Rod, Box 9626SM, Hollywood 27, Calif.

IMAGINE. 250 miles per gallon your car now. Literature 25c. Jet Engine Co., St. Augustine, Fla.

INTERESTED in automobiles? Send for free sample copy. Franson's Weekly Motor News, Box 254, Eugene, Oregon.

"SPEED & Mileage" Manual—(New, revised!) Easily obtain greater speed, mileage, racing performance from any automobile! Famous original book shows soup up methods; speed tuning; mileage secrets; Speed Equipment plans; "Customizing Ideas"! Photographs! Complete instructions on building inexpensive power equipment! Economizers! Superchargers! Manifolds! "Water Injectors"! Mufflers! Fast Conversions! "Hot Rods"! Custom Sports cars! All about engines "Economy Tuning", compression, fuels, trials, "Racing Tricks"! Latest "Hollywood Stylizing"! Streamlining! Sport Changes! Simple Conversions (California Roadster Plans)! Parts Lists! Speed Catalogues! "Beautiful Pictorial Supplement" Folios! 125 Illustrations! Working Diagrams! Complete Data! Everything \$1.98. Almquist Engineering, Milford 59, Pa.

1949 CUSTOMIZING Manual—Shows how to easily make your car look beautifully custom! Latest Restyling, Streamlining, customizing Methods! Hollywood Sport Changes! Fast model conversions! Scores of photographs—illustrations—drawings! "Hop-Up" specifications. Complete restyling information. (Including Custom Car Catalog and Amateurs "Idea Starter" kit). Everything \$2.00. Almquist Engineering, Milford 59, Pa.

SPEED Equipment Bargains! "California" Mufflers \$4.50. Duals \$17.50. Racing Heads \$29.00. Dual Manifolds \$9.95. Water Injectors \$4.95. Chrome Echo Cans \$1.65. Supercharger Stacks \$2.98. Lowering Kits \$2.95. Chrome Strips 90c. Others! Illustrated "Handbook-Catalog" 25c. Almquist Engineering, Milford 59, Pa.

2 AUTO SUPPLIES & EQUIPMENT

AUTO parts for all autos and trucks. Trans. motors, differentials, fenders, carburetors. Also Body Parts. Security Auto and Truck Parts. 1923-PS Grace. Chicago 13.

AUTO parts. Buy direct. Get dealers' prices. Represent us in your territory. Write requirements. Specify car make. Mechanics Auto Parts. Factory Warehouse. 3807-PS N. Ashland. Chicago 13.

BRUSH Plating Outfits connect to a battery. No tanks or shop required. Free particulars. Gunmetal Co., Avenue K. Decatur, Illinois.

CHEVROLET Parts. Scarce motor, body, sheet metal parts. Grossman Chevrolet. Minneapolis, Minnesota.

MAGNETIC Plug removes dangerous steel grit from crankcase. Only 75c. Specify car. Free information. William Jacques. Rumson, N. J.

HOLLYWOOD "Razz" Horn. Humorous efficient signal with a smile. \$3.50. Ki-Yi Barking Dog Horn \$3.50. Cadel Vacuum Twin air horns. spun brass. Chrome finish. Complete \$29.75 postpaid. E-Z installation any car. Clymer. Dept. B-KY. 1268 So. Alvarado. Los Angeles 6, Calif.

POWER-Tone Mufflers for that power plus tone. Dual Sets complete \$22.00 and \$23.00. Singles for all cars. Also new Power dual intake manifold for Ford and Mercury. Many other items. Dealer inquiries invited. Power Engineering. Dept. PS-3. 4506-R Delmar. St. Louis. Mo.

MOTORISTS save gasoline by Vacuumating overrich mixtures. Fits all cars. For Free particulars write Vacuumatic. Dept. 1477. Wauwatosa, Wis.

SAVE Gas! Instant starting with "Lektron" spark intensifier. Guaranteed. Only \$2.00. Specify car. Electronic Industries. Cleveland 11, Ohio.

WHY pay express from California. Dual Mufflers for Ford and Mercury \$18.00. Singles for all cars \$4.00 up. 3" chrome tips \$2.50 each. Skirts \$16.50 pair. Dealers Wanted. Mello-Tone Muffler Shop. 1220 So. Robinson. Oklahoma City, Okla.

PISTONS—Old and New Cars. M. Merryman Co., Lawndale, Calif.

FINE Seat Covers—Front and rear, no arm rest. \$12.50 with order. Comet. 4017 Pingree. Detroit, Michigan.

"SUPERCHARGER" Needle valve—Increases speed, power, pep! Starting 10% more mileage guaranteed! Free trial! Quickly replaces idling jet. Specify car \$1.50 (eights take 2, six's 1). Almquist Engineering. Milford 59, Pa.

"AIRFLOW Needles". Save gasoline. Write for free trial! Neher Industries. La Verne 6, Calif.

TWIN-Tone Chrome Tail Pipe Extension. Protects Your New Chrome Bumper from Corrosive Exhaust Gases. 2 1/2" Diameter Gives Your Car a Deep Powerful Sound \$1.75 Postpaid. Specify Year and Model of Car. Elmer's Muffler Shop. 139 East Manchester Ave., Los Angeles 3, Calif.

"SMOKO" Generates fantastic smoke screens! Free information! Smoko Engineering Co., Huntington 5, Indiana.

3 AUTO TRAILERS

BUILD Your own trailer! Save money! Have every feature you want! Plans for house, sport, camp and utility trailers. Catalog describing 9 models 10c. 15c in Canada and overseas. Jim Dandy, Box 125-B, Wausau, Wisconsin.

4 MOTORCYCLES, BICYCLES, SUPPLIES

MOTOR Scooters, bicycle engines, 120 miles gallon. Dime for catalog. Clymer. Desk B-35. 1268 So. Alvarado. Los Angeles 6, Calif.

WHEELS! Build wagons, scooters, snowers, trailers, wheelbarrows, grocery carts, baby carts, play pens, baby carriages. 4" to 16". Free list. Trulsen Mfg. Co., 811 E. 31, Kansas City, Mo.

RECONDITIONED motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales. Kansas City 1, Mo.

JET Propelled Bicycle. Assemble your own. Photo and Instructions \$1.00. Rush order. Maupin. Tipp City 6, Ohio.

WORLD'S 1st Jet Turbine Bicycle Engine. Fits any bike. Smooth economical. \$150. Dealers Wanted. Literature 25c. Jet Engine Co., St. Augustine 11, Florida.

MOTORCYCLE Books. Complete servicing information all American motorcycles \$1.50. Triumph, Ariel, B.S.A., Norton, Villiers. \$1.50 each. Modern Motorcycle Mechanics large book all foreign. American makes \$3.95. How Obtain Speed \$1.50. How to Manage Motorcycles \$1.50. Catalog free. Clymer. Dept. B-MC. 1268 So. Alvarado. Los Angeles 6, Calif.

MOTORSCOOTERS. New Design. 6 big features. Literature 10c. Rollaway Motors. Lancaster, N. H.

CUSHMAN motorscooter \$8. midget car \$25, motorbike \$10 less motors; motors \$3 up; Harley engine \$5; motorbike conversions \$5; Midget racer and parts \$40. Winter Special: Four balloon tires for motorscooters or midget cars \$3. Mailorder only. Over 6000 tires in stock. Plenty brand new Regal motorscooters less motors \$37.50. plenty new midget cars, engines, automatic clutches, transmissions, etc., in stock at factory prices. Send 25c for Big War-Bargain Catalogue Number 29 just out listing these and almost 400 other bargains. (35c by First Class Mail.) Midget Motors Directory. Athens, Ohio.

CUSHMAN Scooter \$35. Briggs motor \$18. Maytag motor \$15. Many more bargains in the Exchange Bulletin. Send 25c in coin. 35c first class mail. Behnke's. 5721 Leland. Chicago 30, Ill.

HIGHLY Polished Motorcycle Lapel Pins. Harley, Indian, Norton, B.S.A., Sunbeam, Ariel, Triumph, Velocette, 75c each. Tie Clasps \$1.00. Specify make wanted. Catalog free. Clymer. Dept. B-LP. 1268 So. Alvarado. Los Angeles 6, Calif.

5 AVIATION

PROPELLERS. Plans for ice sleds, snow sleds, air boats. Catalog 10c. Banks-Maxwell. Ft. Worth.

PROPELLERS—2-3 Blade. for sleds, air-drive boats. Catalog. Standard Aero Craft. Box 387. Ft. Worth, Texas.

7 ELECTRICAL SUPPLIES & EQUIPMENT

RECTIFIERS: Ramyr Selenium Platers. 10, 30, 50, 100 amp sizes. Immediate shipment. Complete line of bronze baby shoe mounts. Write for list. Hollywood Bronze Supply. Dept. S. 1770 N. Vermont. Hollywood 27, Calif.

BUY Lamp Parts Wholesale. Parts you need for building, repairing, or assembling. Save money on large or small orders. New catalog for 10c. Gearon Company. Dept. 300-A. 27 South Desplaines. Chicago, Illinois.

LAMPS—If you Build or Repair and have had trouble getting parts, your search is ended! Speedy 24-Hour Service from most complete stock in country. Illustrated catalog 10c. Dealer—Send business card for quantity discount. Gyro Lamps. 5402B Clark. Chicago 40.

LAMP Parts—Fittings—Shades—Wrona Lamp Co., 2012 Cortland Street. Details 10c. Chicago 47.

FREE Catalog—Motors, Welder, Welding Supplies. Generators. Home Freezers. many other electrical bargains. LeJay Company. Minneapolis, Minn.

ELECTRICAL Supplies. Lighting Fixtures. Lamp Parts, wholesale prices, any amount, from manufacturer. Catalog 10c—Fidelity. Dept. "A". Box 368. Miami 3, Florida.

ELECTRIC Pencil: Engraves all Metals \$1.25. Beyer Mfg., 10511-C Springfield. Chicago 43.

LAMPS—Build Own Originals. Parts Wholesale, any amounts. Catalogue 10c. Brown Lamp Co., No. 501. Wellston, St. Louis 12, Mo.

"INSTRUMENTS". Professional Type Electronic Volt Ohmmeters—Signal Generators—Tube Testers—etc., for Fraction of usual cost. Save money. Instruments Development Co., 605 Memorial Dr., S.E., Atlanta, Ga.

ELECTRIC Eye Burglar Alarms. Light Beam and Light Source Entirely Invisible. From 10 to 1,000 ft. J. & Jean Signal. 150 Governor St., Paterson 1, N. J.

8 WELDING, SOLDERING

WAR Surplus 200 Ampere generators \$33.00 each. Free literature. Lewis Short. Burrton, Kansas.

WELD by chemical energy metals of almost any thickness. Complete equipment \$2.50. Literature on request. Mike Obele. Po. Box 611. Colorado Springs, Colorado.

WELDERS! New Portable Champion Special Transformer Welder: 110/120 volts. AC 9 heat stages up to 75 amps; Welds, brazes, solders, cuts all metals. Easy to use. Simple instructions. Special Flame Weld Torch Free. Splendid for Shop, Farm, Home repairs. Saves hundreds of dollars yearly. Only \$27.50. Also heavier models. 10 Day Free Trial. Magic Welder Co., 239 PS Canal St., New York, N. Y.

RADIATOR Repairing, cleaning explained. How to equip Shop at low cost. Supply sources, trade secrets told. Instruction system. Radiator Service. McBain, Michigan.

OXY-Acetylene "Demurrage free" Linde cylinders. Purox apparatus. Oxweld supplies. Metalmaster outfits. Miller electric hobby welders, approved fire extinguishers. Free literature. A-A Welding Supply Co., Dept. B. 9228 So. Ada St., Chicago 20, Ill.

NEW Double Voltage Generator 110 Volt 1200 Watt A.C. & 200 Amps 28 Volt D.C. Excellent for Welding & Experimental \$19.75 F.O.B. If interested in Other Surplus Send 25c for List. Surplus Sales. 224—24th St., Niagara Falls, N. Y.

WELDERS. 110V. welds 1/2" steel \$32.50. Morris Welding Service, 1850B State. Schenectady 4, N. Y.

ONLY \$9.95—Newly Invented Four-Way Welder does brazing, soldering, welding and cutting. It's easily operated from any properly wired 110 volt A.C. or D.C. line. Saves time, money on auto, home appliance, farm and shop repairs. All supplies furnished including simplified instructions. Fully guaranteed. Order one today for 10 day trial or write for free particulars. Four-Way Welder Co., 3180 North Clark Street. Dept. PSC39, Chicago 14, Illinois.

10 MACHINERY, TOOLS, SUPPLIES

DRILL GRINDER for twist drills \$2.95. See ad on page 283.

SHEBEL Saw Filer files all saws. Circular. A. P. Shebel. 730 S. 2nd St., Milwaukee 4, Wis.

BAND-Saw for home workshop—Hobbyists. Special \$14.95—Equals high priced band saw. Circular free. Woodcraft Tools, Inc., 147 E. Lake. Minneapolis, Minn.

AIR Pumps—Large volume, low pressure, dual hose, hand operated—Ideal for inflating beach rafts, etc. \$2.00 postpaid. Van Zandt Bros., Blawenburg, New Jersey.

"TIRES"—Save 1/3. New, rugged all purpose airplane tires, 10 inches to 56 inches high. Complete wheel assemblies attach easily to your axles. Free details. Write card today. Airplane Tire Co., Box 1201B, Tulare 1, California.

YOUR own machine shop will save time and money on your repairs. Your neighbors work will pay you \$2-\$3 per hour. Our surplus machines are accurate, low-priced and delivered at once. Screw-Cutting engine lathes \$150 and up. Powerful upright drill press from \$110. Milling machines \$150, some higher. Shapers, welders, band saws, grinders. Our guarantee: Satisfaction or your money back. Conversion Parts Co., 277 Adams St., Boston 22, Mass., U.S.A.

CIRCULAR Saw sharpener. Complete \$6.95. Free literature. Sure-Sharp, Box 24-f, Santa Ana, Calif.

FIRE extinguishers. C-O-2 \$3.82. Domonkos. 98-B3 Vermont. Newark 6, N. J. Agents wanted.

HOME Lathe owners—Build your own attachments. Send for picture, sample of work and list of blueprints. Cut gears, ratchets, etc. Make neat screws easy way. The Home Shop. 415A Raymond Ave., Glendale 1, Calif.

LEVER-acting tailstock and releasing dieholder "6-12" lathes. Complete kit \$7.00 postpaid. Dymax Engineering. Box 262, Meriden, Conn.

TOOLS, machinery for home craftsmen, hobbyists, mechanics. Make your shop pay profits. Details free. Precision Tool Service. 55 E. Washington. Chicago 2, Illinois.

CONCRETE Block machines from \$39.50. Catalog free. Concrete Equipment Company. 5466 Gravois. St. Louis 16, Missouri.

BACK geared metal and wood cutting 12" band saw, 6" jointer, ball bearing, 47" long. Ball bearing spindle shaper, 15" x 20" table, 8" tilting table, ball bearing bench saw. Lowest priced line of high grade tools on market. Free catalog. Dealers wanted. Backus Machine Co., Boyd, Wisconsin.

SURPLUS Machinery, tools, etc. Rush name. Wayne Engineering. Elkins 2. W. Va.

PORTABLE Electric drills 1/4"—\$18.00; 3/8"—\$24.00; 1/2"—\$26.00. E & H Supply Co., 429 Chestnut St., Audubon, N. J.

POWER tools, equipment wholesale prices. Free Bulletin. Homecrafters Co-operative. Grand Rapids 6. Michigan.

13 BATTERIES, GENERATORS, ETC.

EDISON Non-Acid Lifetime Storage Batteries for Home Lighting. Motors. Industrial uses. Radios, etc. Free interesting literature. Hawley Smith Co., Croton Falls 2. N. Y.

14 BOATS, OUTBOARD MOTORS, ETC.

NEW, used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply. Dept. 23. Coldwater, Mich.

MARINE conversions for Ford and Jeep engines. Catalog 10c. Lehman Manufacturing Company. Department A. Newark 2. New Jersey.

FULL size, cut to shape boat patterns. blueprints, 7 1/2—38 feet. Illustrated "Build a Boat" catalog, 10c (coin). "How to Build Boats" book, \$1.00. PolyWog Houseboat Plans \$10. Cleveland Boat Blueprint Co., Dept. A-77. Cleveland, Ohio.

BUILD Your Own Boat by the Welch System. Ready Cut Parts. No Experience Necessary. Save 2/3 Cost. Rowboats to Cruisers. Illustrated Catalog 25c. Midwest Boat Company. Menomonee Falls, Wis.

BOAT plans, kits—Hardware—Conversions—Plywood—See Marine Mart display ad page 53.

GOOD used marine engines. Free catalog. Lind Company. Coldwater, Michigan.

15 ENGINES, MOTORS, ETC.

WINDING Data, listing 225 motors, single and three phase. \$1.00. Motor Data. Box 7631. Kansas City 3, Mo.

MOTORS: 1/4 HP General Electric \$8.50. 1/2 HP Century \$12.50. Send M.O.. Rebuilt sizes to 7 1/2 HP. List 10c. A. C. Motors. 3101 North 32nd St., Philadelphia 32, Pa.

MOTORS! 1/2 HP DC converted to AC. All new. High speed 110 volt. 25 or 60 cycle, ball bearing motors. Actual value about \$75.00. Now \$15.00 each or 3 for \$40.00. With forward and reverse switch \$19.50. 3 for \$50.00. Countless uses for home mechanics. Can be used in any position. Order today! Immediate delivery! No C.O.D. order. "Amazing Bachman's," 27 Herman Street, Rochester 5, New York. Dept. PS.

ELECTRICAL repair men, send for literature on Motor Winding tester and A.C. motor winder. Motor Industries, Quincy, Illinois.

16 AMERICAN POLICE JIU JITSU

DEADLY Judo—Fiercest fighting technique. Trick knockouts. (200 photographs—plus illustrations.) Expert instructions—Three volumes. Complete \$2.25. Variety House. Box 46-A. Wall Station. N.Y.C. 5.

18 BODY-BUILDING COURSES

BIG Bargains, 12 Courses \$1.00. News 10c. Sid's System. Southgate, California.

BARBELLS, Dumbbells. Exercise equipment. Courses. Free booklet. Good Barbell Co., Reading, Penna.

FREE Catalog . . . Barbells finest quality \$8.98 and up. Enclose 10c postage please. Dan Lurie Barbell Company, 1729 Rockaway Parkway, Brooklyn, N. Y., Dept. 150-c.

19 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY

180 PAGES antique and modern pistol, sword, etc. values. 50c. Robert Abels. 860 1/2 Lexington Ave., New York 21.

SEND 10c for list 100 used guns. Frayseths. Willmar, Minn.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 40c. Smith Museum, Runnemedde, N. J.

"SHOTGUNS"—"Rifles"—"Handarms"—"Ammunition"—"Rods"—"Reels"—List 10c. PS-Rudolph's, Atchison, Kansas.

NYLON Fishing Lines. Braided, 200'-20 lb. Test \$1.00. 175'-35 lb. Test \$1.00. Longer Lengths Available. Macmills, Pleasant Valley, N. Y.

SURPLUS Camping Supplies. Bargains. Free Catalog. R. McManus, Cuttingsville 5, Vt.

SHOTGUNS—Richardson R-5. Single Barrel, 37 inches long. Weight, 5 3/4 lbs. Price, \$14.95 each. Cameo. 432 West 42nd. New York.

FREE, new Spring Catalog of guns. Fishing tackle. Athletic goods. Camping equipment, cameras. Western goods. Write Andy Anderson's Sporting Goods Co., 120 W. Grand, Oklahoma City, Okla.

AMMUNITION 175 Sizes in Stock. American. Foreign. Dime for List. Central Sports, Delphos 11, Ohio.

SELLING: 300 Historical Firearms:—22 000 Indian Relics. Coins. Gold Dollars. Confederate Currency. Kentucky Rifles. Muskets. Cartridges. Rifles. Pistols. Swords. Ramrods. Powder Horns. Fossils. Minerals. Agates. Flintlocks. Violin Wood. Bowood. Bullet Molds. Steerhorns. Deerhorns. Trophies. Mounted Owls. Pheasants. Arrowheads. Gempoints. Tomahawks. Spearheads. Bannerstones. Percussion Caps. Illustrated Catalog 25c. Heike, Wenona 30, Ill.

20 FIELD GLASSES, TELESCOPES, ETC.

TELESCOPES, Binoculars, Microscopes.—big bargain catalog free. Brownscope Company, 24 West 45th Street, New York.

"TERRIFIC" Bargains—Government Surplus Telescopes, Binoculars. Send \$1.00 for 10 piece Hobbyist Lens Set. Contains magnifying and reducing lenses. Send stamp for "Bargain" list. H. Jaegers. 93-08 95th Ave., Ozone Park 16, N. Y.

REFLECTING Telescopes, completely assembled, 60X, \$25.00. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

POWERFUL Astronomical telescopes easily made. Perfect lenses and instructions: 100X \$3.00, 100X and 200X \$4.00, 100X, 200X, and 400X \$6.00. Clear Vision, full power guaranteed. Instructions alone 10c. Suffolk Science Service, Manorsville, N. Y.

ASTRONOMICAL Telescopes, binoculars, microscopes; Bought, sold, repaired. Books. Lists 10c. Rasmussen-Reece, Amsterdam, New York.

POWERFUL Astronomical Telescope. Equatorial Mounting. Two Eyepieces \$16.50. Bluhm Optical Lab., 4213 Gifford Avenue, Cleveland 9, Ohio.

24 DOGS, BIRDS, PETS, RABBITS

SEE Gulf Hamstery ad page 94. Shows picture of Hamster.

\$250 MONTHLY, Raising Angora Rabbits. Particulars free. White's Rabbitry, Newark, Ohio.

GOLDEN Hamsters, profitable, interesting. Adult trio \$7.00. Information. Robert Probert, Box 315, Valdosta, Georgia.

RAISE Guinea Pigs. Make money at home. Big demand. Booklet free. Taylor, Box 426B, Hapeville, Georgia.

HOBBY Catalog 10c; Reptile Bulletin 5c. Hamsters \$2.75 pair; alligator \$2.50; newt 25c; chameleon 25c; European lizard 75c. Quivira Specialties, Topeka, Kansas.

25 FROG RAISING

FROG-RAISING—New book explains everything! Broel, 1035 Marlborough, Detroit 15, Michigan.

30 FARMS, OTHER REAL ESTATE

OZARK Lands for All purposes. Actual river frontages. 5 acres \$90.00 and upwards. Free list and literature. Hubbard, 424-H. Minnesota Ave., Kansas City 4, Kans.

GOOD FARMS—Ranches. Washington, Minnesota, Montana, Idaho, Oregon, North Dakota. Dependable crops, favorable climate. Write for literature, lists describing typical farm opportunities. Specify which state. J. W. Haw, 120 Northern Pacific Ry., St. Paul 1, Minn.

BIG Lists Farms, Ranches. Water Frontage Properties. Free descriptive folders, prices. Splendid opportunities. Washington, Idaho, Montana, Dakotas, Upper Michigan, Wisconsin, Central Corn Belt. Information regarding Columbia and Missouri River Basin irrigation projects. L. H. Robbins, Milwaukee Railroad, 736M Union Station, Chicago 6, Illinois.

HIGHLANDS, Florida near Alabama. Large lots, \$5.00 monthly. Fred Delker, 2219 Venango, Philadelphia 40, Penn.

STROUT'S Fall-Winter Farm Catalog—Free! Red cover. Chock-full of bargains Coast-to-Coast. Eqpd & uneqpd farms, groves, retirement places, etc., etc. Write today for your Free copy. Strout Realty, 255-ZB 4th Ave., New York 10, N. Y., 20 W. 9th St., Kansas City 6, Mo., 453 S. Spring, Los Angeles 13, Calif.

TEN acres good land, \$250, \$10 down. \$10 monthly. R. W. Stewart, Inverness, Florida.

SOLD For Taxes! California, Oregon, Washington, timber, grazing, ranch & mining lands 25c to \$3.00, acre minimum bid, 10c (coin) brings circulars and maps. Pacific Lands, Box 2350-PS, Hollywood, California.

31 POULTRY AND SUPPLIES

RAISE turkeys the new way. write for free information explaining how to make up to \$3,000.00 in your own backyard, address National Turkey Institute, Dept. 57, Columbus, Kansas.

BABY Chicks, Champion Mated, 52 varieties, 6 Hybrids, licensed inspected, bloodtested. Rush postal, large colored book Free, low prices. Berry's Farm, Route 11, Clarinda, Iowa.

YOU Can Make Money from poultry this year! Future outlook excellent. Our Experimental Farm advice will help you. Subscribe today! \$1.00, two years. Poultry Tribune, Dept. 17, Mount Morris, Illinois.

32 PROFITABLE OCCUPATIONS

\$5000 FROM half acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, 1169 Corydon, Winnipeg, Canada.

\$40.00 WEEKLY, Made growing mushrooms. Fresh. Dried. Dominion Patent 331,583, free spawn. North American, 169Y Yonge, Toronto, Canada.

NO selling, operate coin machines, amazing profits, details Free. Parkway Corporation, Dept. 12, 623 W. North Avenue, Baltimore 17, Maryland.

ANNOUNCING home study course in commercial baking. Practical basic training. Good field for those with aptitude. Nearly depression proof. Send for Free booklet, "Opportunities in the Baking Industry." National Baking School, 1315 Michigan Ave., Dept. 1721, Chicago 5, Ill.

SENSATIONAL! It's easy to earn big money with your own profitable business. Earn \$10.00 to \$50.00 a day. Make lamps at home. General illustrated course teaches you quickly. Course and wholesale supply catalog only \$2.00. Gearon Company, Dept. 200-A3, 27 South Desplaines, Chicago, Ill.

LEATHERCRAFT—For Fun! For Profit! Make your own Leather Novelties, Belts and Bags in spare time. A Hobby you will love. Complete Kits and equipment for Tooling, Carving & Embossing at very low cost. Send for Free Catalog describing Tools, Leather & Instructions. Jonas Handicraft Co., (Dept. S-2), 32 Frankford St., New York 7, N. Y.

MAKE money with hamsters. New Tiny animal. Easily raised at home. Write for details. Hudson Hamstery, R-1, Newfoundland 2, N. J.

LOCKSMITHING secrets! Key fitting, lock repairing, opening; prices, sources. Illustrated book \$1.00. Wechsler, 7 West 36, New York City.

SOAP, Ten easy recipes \$1.00. Nunn, 659 E. Oxnard, Calif.

\$46 FROM Square Foot Plywood. Jigsaw necessary. Write. Woodarts, X-41, Bridgewater, Mass.

SEE "Kurl-Keep" advertisement under "Business Opportunities"—Fascinating new money-maker!

33 BOOKS, PERIODICALS, ETC.

MAGAZINES (back dated)—foreign, domestic, arts, Books, booklets, subscriptions, pin-ups, etc. Catalog 10c. (refund). Cicerone's, 863 First Ave., New York 17, New York.

"ADULT Stories," 25c. Fifteen—\$1.00! Free catalogs! Hirsch, Spring Valley 3, New York.

USED Correspondence Courses and Books bought, sold, rented and exchanged. Catalog Free. Lee Mountain, Pisgah, Alabama.

BOOKS, magazines, bargain prices. Free catalogue. Post, 169 Clinton Avenue, Jersey City 4, N. J.

BACK-Date Magazines, Books. Specific issues; years. Arkell's, Tarzana 2, Calif.

SELF-Hypnosis—Amazing new Book! Money-back-if-not-delighted-guarantee. \$1.98 postpaid. Psyche, 542-BD 5th Ave., N. Y. 19.

QUICK profits taking magazine subscriptions, handling greeting cards. Cassell Publishers Service, Westfield, N. J.

BOOKHUNTERS! All Subjects. Send Wants! Jaher Book Service, 620-K East 178 Street, New York 57.

ADULT Books — Revealing Intimate Truths—Illustrated. Four \$1.00. Catalogues 10c. Kogan, 1032-DE Church Annex, New York 8.

"PI", its Probable Base and Transpositions. A new system of mathematical analysis of this three thousand year old question and other problems in natural phenomena. Cloth, 125 pages, three plates, \$2.50 postpaid. Circular free. Ohio tax. Veeratic Laboratories, Swanton, Ohio.

ADULTS Only "Daring Books." Free literature. Home Pix, 1674 Broadway, New York 19.

NEW Illustrated Catalog. Directory \$1.10. Latshaw Sales, Sunnyside Cl, Indianapolis 44, Indiana.

EXCITING, strange, Unusual Books. Send \$2.00 for Sample Book Plus 20 Page Catalog and Private Collectors List. Rare Book Co., Dept. F, 1219½ North LaBrea, Hollywood 38, Calif.

BACK number magazines reasonable. Reedmor, 240 East 9th, New York, N. Y.

"HOW To Develop An Alarm-Clock Mind". Hypnotic, self-suggestive methods revealed. Unique instruction folio—25c. Catalog of unusual books included. Power Publishers, 790 Broad St., Newark 2, N. J.

35 MAGIC TRICKS, PUZZLES, ETC.

MAGICIANS' Gamblers' secrets exposed. Cards, Dice, Punchboards, Slot Machine, Catalog 15c. Book Co., Box 671, St. Louis 1, Mo.

FREE Dollar Magic Set with Professional Catalog 25c! "Mysto," 4462-PS Germantown, Philadelphia.

ITCHING, Sneezing Powders, Eighteen Other Tricks and Joker's Catalog 25c. 2404N15, Philadelphia.

"VENTRILLO" Professional Voice-throwing Instrument and Catalog 25c. Box 971-PS, Philadelphia.

500 TRICKS, new 1949 edition. Send 10c for Douglas famous Catalog showing best in good magic, lowest prices, fastest same-day service, 30 years in business. Douglas Magicland, Dept. 2, Dallas, Texas.

1000 NOVELTIES, 500 Page Catalog 10c —Hobbies, Funmakers, Jewelry, Gadgets, Time Savers, Johnson Smith, C-60, Detroit 7.

WE supply every noted magician. Large professional catalog 50c. Holden's, P220 West 42nd Street, New York.

LEARN magic, Ventriloquism, Mind-reading. Write for particulars. Quackenbush, Big Flats, N. Y.

400-PAGE Catalogue of 2000 Tricks, pocket, parlor, stage. World's Finest Magic. Send \$1.00 for Catalogue (refunded first \$5.00 order). Kanter's, S-1311 Walnut, Philadelphia 7.

FREE Trick With Illustrated Magic Catalogue, 25c. Hall Magic, 345 John R, Detroit 26, Michigan.

VANISHING Quarter trick and catalog 25c. Sterling Magic Co., Royal Oak, Mich.

HYPNOTISM Taught with Phonograph Record \$1.00, Harold Tyndale, 2958 Wynwood Lane, Los Angeles 23, Calif.

FREE: Mystifying "Magic Library" folio. Lynch, 402-12 Hazlett, Baltimore 29, Md.

279 MAGIC Tricks Revealed 50c. F. Dupont, 19 Kenneth, Arnold, Penna.

HYPNOTISM: 25 Lesson Course. \$1.00. Monarch, 38-S Jefferson, Auburn, New York.

LARGE 160 Page Magic Catalog 35c for Beginners and Professionals. Chicago Magic Company, 2300-D No. Mason Avenue, Chicago 39.

TRICKS, Secrets, cards, punchboards, etc., explained. Big illustrated circular 10c. Mack, Box 1278-P, San Francisco.

MAGIC Indicator locates different minerals \$20.00. Guaranteed! Chas. Horton, Belle River, Illinois.

HYPNOTIZE! Control the minds and actions of others! Completely illustrated course \$1.00. Money Back guarantee. Fowler, Box 1284, Boston 4, Mass.

36 GAMES, ENTERTAINMENT

HOME Model Slot Machines, Games, Home Bars. Send for wholesale catalog. Webb Distributing Co., 4958 W. Chicago Ave., Chicago 51, Ill.

FACE Masks—Life-like, Latex Rubber as Monkeys, Witches, Clowns, Devils, Fat Men, Baby Faces, etc. Slips easily over head. \$2.50 each. Also, Rubber Vegetables, Fruits, etc. Cameo, 432 West 42nd, New York.

37 COIN COLLECTING

GET profit and pleasure in collecting old coins. Send 10c for 56 page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Bldg., Ft. Worth, Texas. Largest rare coin establishment in U. S. Established 48 years.

FREE! Foreign coin, banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-D50, Mass.

\$2.00 TO \$200.00 Each paid for hundreds of Old or Odd Coins. Indian-Lincoln-Foreign wanted. Keep all until posted. Send 20 cents for Illustrated Coin Value Book. 4x6. Guaranteed Prices. 40 Years in business. Coin Exchange (1), Le Roy, N. Y.

U.S. coins lowest prices. Send stamp for lists. Hutchinson, 3463 I Street, Philadelphia 34, Penna.

COMMEMORATIVE \$1½ — Columbus, Washington, Cleveland, Stone Mountain, \$1.50 ea. Illustrated Catalogue 25c. Norman Schultz, Salt Lake 9, Utah.

OLD Money Wanted. Will pay \$100.00 for 1894 Dime, S. Mint, \$50.00 for 1913 Liberty Head Nickel (not Buffalo). Big premiums paid for all rare coins. Send 4c for Large Coin Folder. May mean much profit to you. Numismatic Co., Dept. 30, Fort Worth, Texas.

COINS Wanted: Write for list. Elsholz, Box 9914-S, Pittsburgh 24, Pennsylvania.

LARGE \$1.00 bill \$1.60, large \$2.00 bill \$3.40. 100 different foreign coins \$3.95. 255 page guidebook \$1.50. Big bargain catalogue 15c. Bebee Coin Company, 1180 East 63rd, Chicago 37, Illinois.

50,000 COINS, medals, papermoney. Illustrated lists free. Nagy, 8-P South 18th, Philadelphia 3, Pa.

KNOW the True Value of Old Money. Highest Prices Paid. Our Complete Buying-Selling Catalogue. Send 25c. Worthycoin Corporation, 294 Washington (D-107), Boston, Mass.

40 STAMP COLLECTING

DEALER'S Wholesale Catalog. Postage 3c. Franksco, 5031 Queensbury, Baltimore, Maryland.

ZOWIE-E-E! A Barrel of Fun for only a Dime! 500 United States Stamps—Absolutely unpicked and unsorted, just as received from church missions. Many varieties, including large commemoratives, airmails, high denominations up to \$5.00! Stampdom's biggest package of fun, and you might find something really valuable!! Price only 10c to serious approval service applicants. Money back if not delighted. Illustrated bargain lists with each order. Mystic Stamp Co., Dept. 55, Camden, New York.

NICARAGUA "Tin Pan Alley" Diamond, Ecuador showing George Washington, and American Flag in natural colors. Fezzan, Trieste. "American Army" stamp First U.S. Commemorative, \$100.00 Shanghai, Corsica, Anzac, Antique, others all 5c approvals. Capital Stamp Co., Dept. 10, Little Rock, Ark.

FREE—Famous Americans set, plus Flag set, plus the National Parks set, plus the Presidential set to the \$5. A total of 90 stamps absolutely free to customers for our unsurpassed United States or Foreign selection. Send 3c postage for 15 of the above mentioned stamps and full particulars. Triboro Stamp Company, 145 Nassau Street, Dept. 203, New York.

FREE! Crystal-Mount Sample. Harrisco, 204 Transit Bldg., Boston, Mass.

300 DIFFERENT given free with approvals. Postage 3c. Windsor Stamps, 1435 E. 67th Place, Chicago 37.

UNITED STATES approvals complete coverage fine quality, attractive prices. Seminole Stamps, Box 1138-S, Coral Gables, Florida.

200 BRITISH Empire Stamps—only 3c! Kenmore Stamp Co., Arlington 74S, Mass. Free—Illustrated Catalog! Kenmore Stamp Co., Arlington 74S, Mass.

128-PAGE United States Catalog. 1,000 illustrations. 10c. Harris & Co., 204 Transit Bldg., Boston.

WORLD'S Largest Stamp (7½ x 14 inches). A real curiosity! Retail for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 50, Mass.

200 DIFFERENT, including Roosevelt triangle, 5c to approval applicants. S. Avalon Stamp Co., Springfield, Mass.

FREE, Irish commemorative collection, including Rebellion issue with approvals. Raymax, 123-X William St., NYC 7.

POUND stamps containing thousands \$1.00. Longacre Shop, 100c West 42nd, New York City 18.

WORLDWIDE Different: 200—25c; 500—50c; 1000—\$1.25; 2000—\$3.00; 5000—\$15.00. Beacon Sales, Maynard 3, Mass.

FREE—Pictorial-Set-To-Approval-Appliants. Dot's Stamp Exchange, P. O. Box 407, Montrose, Pa.

BIGGER Better Lower Priced United States Approvals, Box 488A, Minneapolis.

15,000 Different Stamps 2c Each! Gordon Davison, Box 1019A, Manchester, N. H.

U. S. 797 SPA Sheet only 5c to applicants for U. S. approvals. M. Haycock, 333—86th St., Brooklyn, N. Y.

OLD, scarce U. S. seconds on approval. Slightly defective, bargain prices. Hearnfeld, Clintonhill Station, Newark 8, N. J.

FINE Approvals. Fast, personal service. What countries do you prefer? I'll send their stamps. Milton Skinner, 438 Locust, Long Beach 12, Calif.

\$3.00 CATALOGUE Value—Airmails, Etc. 10c when requesting approvals. Florida Stamp Company, Box 807, Miami 5, Fla.

FLAG Stamp Free With U.S. Approvals. E. Wenigmar, 1933 Patterson, Chicago.

10 U. S. Over 40 years Old 5c Approvals. Scott, Middle St., Lexington, Mass., 73.

50 DIFFERENT United States 10c. Price list free. Seidenberg, Eustis, Fla.

FREE—12 different U. S., Approvals accompany. Village Stamps, 90-39A 214th St., Queens Village 8, N. Y.

HI-I.Q. Hinges. New safety feature. Thousand 35c. Three Boxes \$1.00. Stampade, 1221 Huron, Cleveland 15, Ohio.

POSITIVELY Greatest Free Offer—Rare Octagonal (eight sided) stamp, gorgeous diamond, giant triangle, also mammoth and midget stamps, total value \$2.00. All Free to foreign approval buyers. Plus Free, Scott's International \$6.00 album and latest Scott Stamp Catalogues. Odd Stamps, Santa Ana, California.

FREE 100 Different with Approvals. Shore Co., 9 East Adams Ave., Pleasantville, N. J.

FREE—100 Old Issues—Wurttemberg, British Colonies, etc.—Request Approvals. National, Box 42B, Passaic, N. J.

GERMANY (Greater) 500 different \$2.00. Masser, 322 East 9th St., Brooklyn, New York.

FREE! Complete Balkan aviation set with approvals. Beaman, Leeds 10, Ala.

FREE! Tiny Chinese "Midget" War set. Approvals. Seminole, Leeds 10, Ala.

FREE! Negro Triangle; Turks Islands "Cactus"; Dakar, Guinea; Palestine; "Fairy Tale." Pirate Chart, Ship, Sea Lion, Snake Stamps; French, British, Portuguese Colonies, etc. Free for 3c postage. Approvals. Potomac Stampco, Washington 10, D. C.

LION Triangle, Biggest Diamond, San Marino showing First American stamp, Canal Zone, Constantine, Rheinland, and 26 Different Others—All 5c Approvals. Grayson Stamps, Sherman, Texas.

ABSOLUTELY Free — Gilbert, Ellice, Cook Islands, Tonga, Seychelles, Ascensions—free to approval applicants. Viking, 130-P Clinton St., Brooklyn, New York.

GENUINE "Goya Nude" set 10c (Catalogs 55c). Approvals. Royal Stamp Company, Tamaqua 2, Pa.

FREE Copy New Interesting Stamp Newspaper. Southern Philatelist, Miami 42, Florida.

FREE! Mint United States, Armenia, South America, Russia Packet, approvals. Greenwood, 263 Meridian, Miami Beach, Florida.

ARTCRAFT First Day Cover Club. Send for Illustrated Circular. Lincoln Exchange Club, Box 84P, Chatham, New Jersey.

FREE! Liberia Triangle Airmail Set. approvals. Martin, Box 1128, Miami Beach, Florida.

UNITED States Bargain. It sounds unbelievable, but It's True! 50 different United States stamps ranging in age as far back as over 60 years and in face value as high as one dollar. Only postage, commemorative, and air mails included. Nothing else. Extra 2 Jap Occupation of Philippines, all for only 10c to approval applicants. Please state whether approvals shall consist of U.S. or Foreign stamps or both. Globus Stamp Co., 268 Fourth Ave., New York 10, N. Y., Dept. 221.

A WORLD of Stamps for 10c. 19th Century U.S., Pictorials, Air Mails, British Colonies, etc., to new approval applicants; also a fine approval selection included. Send 10c today to Cosmopolitan Stamp Co., 1457 Broadway, N. Y. C.

FASCINATING! Nineteenth Century U.S. 20 different 10c to approval applicants. AAA Stamp Company, Arcade Building, St. Louis 1, Missouri.

FIFTY Stamps from Fifty Different Nations. 10c. Garrow, Montevista, Chula Vista 2, Calif.

100 STAMPS. Album, Gauge—25c. Box 6618, Northeast, Kansas City, Mo.

STAMP Buyers' Guide plus 100 different Worldwide for 10c. Stampguide, Box 1649F, Oakland 4, Calif.

INEXPENSIVE approvals—hundreds of penny bargains. Dept. J, 1267 Tutwiler, Memphis 7, Tenn.

AMAZING "Queer Countries" Packet—Free with Approvals! Saxon, Walden, N. Y.

307 ALL Different 10c. You will find scores of new varieties here for your collection! Big and little stamps, bisected stamp, Commemoratives, triangles, High values! Bicolored Beauties! Strange countries! Every stamp is different. All for only 10c to approval applicants. Write today and receive special Ionian Island stamp extra. Garcelon Stamp Company, Box 418, Calais, Maine.

50,000 STAMP Grabbags 25c each. Anderson, 630 Bingaman, Reading 2, Pa.

BECOME successful stamp dealer through our proven method. Details free. Largentiere Co., 6462A 83rd Place, Forest Hills, New York.

ATTRACTIVE United States on approval, low priced, Wakonda, 140-F Nassau, New York City 7.

FREE U. S. Foreign Price Lists. Schneider, Jr., Route 3, McHenry, Ill.

"UNITED-States" Commemorative Collection Thirty-three different unused, Columbians to 1943 Commemoratives only. Price \$1.00 Request Approvals, "Stamps", Albany 2, New York.

25 DIFFERENT Denmark sent to approval applicants enclosing 3 cents postage. G. D. Durden, Box 846, Orlando, Fla.

75 STAMPS from 75 countries 10c to approval applicants only. Bjorn Nielsen, Monmouth 1, Maine.

\$1.00, \$2.00, \$5.00 United States Free. Approval Applicants, Flamingo, Box 4038, Miami 38, Florida.

FREE! U. S. Monthly Lists. Fine Stamps! Cole, 43-G Rinewalt, Buffalo 21, New York.

FREE Nicaragua Roosevelt. Illustrated Bargain list, Imperial, Dept. 1491, Tampa, Florida.

FRENCH Colony Packet. \$1.00, \$2.00, \$5.00 U. S. Free with Approvals, Hialeah Stamps, Box 3441, Miami 22, Florida.

500 WORLDWIDE—mint, used. 25c. Gaspar, Box 1492, Pittsburgh 30, Penna.

BRAZIL Diamond shaped set, 10c with approvals. Vargo Stamps, 6044 South Fairfield, Chicago 29, Ill.

ONLY 1c Romania School Issue with Foreign Approvals. Modern Stampco, Box 12A, Wakefield Station, N. Y.

UNITED States Stamps, approvals, bargain prices. Metropolitan, 140-A Nassau, New York City 7.

FRENCH Colonies 50 Different Pictorials. 10c with Approvals, Field, 1939 E. 85, Cleveland 6, Ohio.

BERLIN Bears. Complete set of eight and 100 different stamps only 10c to approval applicants. Reich Stamp Co., 4647 Kenmore, Chicago 40, Ill.

UNPICKED: 5,000 U. S. \$2.00; 5,000 Foreign \$3.00; 1,000 British Colonials \$2.00. Satisfaction guaranteed. Kuhn, 81-10 Broadway, Elmhurst, N. Y.

FREE—China Constitution Issue with Foreign Approvals. Stamp Service, 644 East 233rd Street, New York.

100 DIFFERENT U.S. Commemoratives \$1.00 with Approvals. Henry Bandsley, Roslyn, Pennsylvania.

FREE—Illustrated Bargain Lists—Albums, Packets, Supplies, Special Offers. Littleton Stampco, Box 50, Littleton, N. H.

20 LIECHTENSTEIN 10c different. Exceptional approvals, Chase, 1026 Walker Ave., Oakland 10, Calif.

AIRMAIL packet, Big Bargain. With approvals only 5c. Arthur Wirth, Norwichtown 2, Conn.

25 DIFFERENT stamps 10 cents; F. Tunis. 54 Wakeman Ave., Newark 4, N. J.

42 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 39-E, 2926 Eye St., N. W., Washington 6, D. C.

50 DIFFERENT army embroidered patches \$1. Other bargains. Insignia Mart, 703B Broadway, New York 3, N. Y.

HYPNOTISM As A Hobby—Send 50c for interesting, instructive Booklet. Brown, Seaview Ave., Swansea, Mass.

10 ANCIENT Indian Arrowheads. \$1.00. List Free. Lear's, Kirby, Arkansas.

UNPAINTED figurines. Illustrated list free. Oman, 642 Broadway, St. Paul 1, Minn.

UNPAINTED Plaster Ornaments. Easily Decorated. Firestone's thick, white, natural-latex Loxite for Rubber Molds, Midwest Novelty Manufacturers, 524-B East Park, Anaconda, Montana.

43 POTTERY & CERAMICS

DRESDEN Figurines. Paint Them Yourself to Resemble Expensive China. Free Instructions and Catalogue, Sally's, 210 S. 4th, Minneapolis, Minnesota.

44 ANTIQUES, RELICS, INDIAN GOODS

SELLING:—300 Historical Firearms:—22,000 Indian Relics. Coins, Confederate Currency, Gold Dollars, Kentucky Rifles, Muskets, Cartridges, Fossils, Minerals, Agates, Flintlocks, Rifles, Pistols, Violin Wood, Bowwood, Ramrods, Powder Horns, Bullet Molds, Steerhorns, Deerhorns, Trophies, Mounted Owls, Pheasants, Arrowheads, Gempoints, Tomahawks, Swords, Spearheads, Bannerstones, Percussion Caps. Illustrated catalog 25c. Heike, Wenhona 29, Illinois.

46 MINERALS & PRECIOUS STONES

"GENUINE" Deep Red Arizona Rubies (Garnets). Send quarter for packet. Bitner's, Box 2651, Phoenix, Arizona.

GEMSTONES, rough, polished, Crystalized specimens. Every variety, lowest prices. List free. Plummer's, 5068 Brighton, San Diego 7, California.

GENUINE Aquamarine. Approximately 14 carat pieces. (Cabochon Grade) \$1.00. Wendt, Troy, New Hampshire.

GEMS, precious and semi-precious, all genuine from world wide sources. Deal direct, no overhead, save money. Catalog 10c. Hill Co., Route 7-K, Salem, Oregon.

47 CAMERAS, PHOTO SUPPLIES

PHOTOGRAPHY for pleasure or profit. Learn at home. Practical basic training. Long established school. Write for booklet. American School of Photography, 1315 Michigan, Dept. 1741, Chicago 5.

HYDROJET, amazing washer for all size prints. Described page 221 December issue. \$3.95 post-paid. Postcard brings list of unusual photographic items. Post Sales Company, 169 Clinton Ave., Jersey City 4, N. J.

LEARN Camera Repairing—Free Prospectus. Mills Photographic Engineering Laboratory, 1857 N. Western, Hollywood 27, California.

BASS Says: Bargaingram 257 ready and waiting for you. The book which tells all the finest in new and used camera equipment, a veritable encyclopedia. Write, phone or call the sign of the old "Horse Trader", 39th year of satisfaction or your money back dealing. Bass buys, sells and trades. Bass Camera Company, Dept. AG, 179 W. Madison St., Chicago 2.

OPERATE your own Photographic Business. Details free! Peace Products Company, Dept. 600, 152 West 42nd St., New York City.

ELECTRIC Movie Cameras. 16mm Army GSAP, original condition, value \$200, complete with 13.5 lens—new \$32.50; used \$19.50. Accessories available for home conversion. Free details! Completely converted Lektro 16mm, ready-to-operate \$49.50, guaranteed. Magazine film for same \$3.50 includes processing. Thousands of Camera, Projector and photo equipment specials—write for Special Bargain Listings. Fotoshop, Room 13, 18 East 42nd St., New York City.

YOUR prized negatives make prize winning photo enlargements with new Precise Enlarger, only \$22.20 complete. Write Tam Products, CS3, 3814 Wrightwood, Chicago 47.

48 PHOTO FINISHING

8 BEAUTIFUL Double Size pictures and roll developed 30c. 8 hour service. Free Malters. Pacific Photo Service, Box 666, San Francisco, Calif.

OIL coloring photographs can be a fascinating hobby or profitable sideline for those with artistic talent. Learn at home. Easy simplified method. Send for free booklet. National Photo Coloring School, 1315 Michigan, Dept. 1721, Chicago 5, Ill.

8 PRINTS all enlarged to nearly postcard size from your roll or negative 25c; 16—50c. (Trial offer) Willard Studios, Box 3535G, Cleveland, Ohio.

FILMS. Fresh. Popular Sizes. Five Rolls \$1.25. Moran's Rexall Pharmacy, Middleport, N. Y.

2 BEAUTIFUL Hi-Gloss prints each good negative and enlarging coupon with each 6 or 8 exposure roll developed 28c. Owl-photo Co., Weatherford, Oklahoma.

THREE prints each 8 exposure roll 40c. Two each 35c. One each 25c. Reprints 3c. L. A. Eastman, Bode, Iowa.

ROLL developed 16 prints 25c. 10 reprints 25c. 50—\$1.00. Dick's Photo, Louisville, Ky.

8 PRINTS and 2—5x7 or 1—8x10 35c. Reprints 3c. 8x10 Enlargements from Negatives or Picture, 3 for \$1.00. Free Malters. Speed Photo, Box 822, G.P.O., New York 1, N. Y.

51 MOTION PICTURES, SOUND EQUIPMENT

8-16MM. Silent-sound films. Complete rental library. All latest subjects. Free catalogue, (sample film 10c). Garden Film, 317 West 50th, New York 19.

HOLLYWOOD films. Color sample, \$1.00 (refunded). Catalogs 10c (refunded). Stone, Lunenburg 10, Mass.

BENEFIT'S Strip-O-Slides, now available. Needed by every artist. 25 Art Studios in life-like color, on 35mm Film Strip complete with 25 ready mounts. Only \$2.95 postpaid. (Add 10c for first class mail.) Series 1, 2, 3, 4, now available. Extra Special Viewer for \$1.50 when ordered with Strip-O-Slides. Benefit Corporation, Dept. A-53, 3807 Benefit St., Baltimore 24, Md.

UNUSUAL 8-16mm. Film Subjects. Kodachrome projection length sample "Allure", \$1.00. Art slides, sample 40c. Films exchanged. Big catalog, 25c; refunded first order. National Film Supply, Broadway Sta. (E), Toledo 9, Ohio.

RENT 16 mm. sound films 50c reel. Large selection; free catalog, U. C. Film Service, 128 Chestnut St., Roselle Park, N. J.

BENEFITS Strip-O-Slides, now available. Needed by every artist. 25 Art Studios in life-like color, on 35mm Film Strip complete with 25 ready mounts. Only \$2.95 postpaid. (Add 10c for first class mail.) Series 1, 2, 3, 4, now available. Extra Special Viewer for \$1.50 when ordered with Strip-O-Slides. Benefit Corporation, Dept. A-13, 3807 Benefit St., Baltimore 24, Md.

LOWEST Prices. Raw Film 8MM-16MM Free List. MK Photo, 451 Continental, Detroit 14, Michigan.

GUARANTEED fresh anti-halo outdoor movie film! Weston 12! Daylight loading! Processing free! Three spools double 8mm. \$3.45! Six single 8mm for Univex, \$4.60! Postpaid! Catalog, Eso-S, 47th Holly, Kansas City 2, Missouri.

KODAK Super-X Movie Film—surplus but tested and guaranteed "good as gold!" 16mm 100-ft. \$3.95; 50-ft. magazine \$3.50; 8mm double 25-ft. \$1.65—processing included. Stock up! Fotoshop, Room 12, 18 East 42nd Street, New York City.

BASS Says: 39 years of leadership guarantees satisfaction. Finest Cine equipment. 8mm., 16mm., and 35mm., silent and sound. Write the old "Horse Trader". Satisfaction or your money back always! Bass Camera Company, Dept. A., 179 W. Madison St., Chicago 2.

TITLE Making, free booklet. Westwood Sales, 535 South Victoria Street, San Francisco, Calif.

35MM SOUND Features. Shorts. Cheap! Reisinger, 2909 Whitney, Baltimore 15, Md.

BARGAINS in good used 16mm. sound films. Complete one reel subjects often available at \$2.95. List for stamp. Blackhawk Films, Davenport, Iowa.

KODACHROME duplicating. 35mm slides; 20c each. 3 or more same slide 15c each. Glass-mounted 10c each. minimum \$1.00. Color Slides and Film Strips from original art work; 35mm Reductions from larger transparencies. Movie Film duplicating—black-and-white or Color. Fast service—write for Prices! Fotoshop, Room 14, 18 East 42nd St., New York City.

WE Buy, Sell, Rent, Exchange Home Movies. Details for dime. Midland, Box 429, Oak Park 3, Ill.

BRAND new 16mm sound projectors \$129.50. Send 10c for photographic catalog. Sterling's, 679 Northampton, Easton, Penn.

LEARN movie projection, management. Free Catalog. Theatre School, Elmira, N. Y.

8MM PROJECTORS, economically Priced. Write Becco, Box 675-B, Charleston, S. C.

"LADY Eve" Glamour. Select Movies. Projectors. Screens. Free Catalog. Home Pix, 1674 Broadway, New York 19.

FREE movie list. Superior Film Service, Box 713, Troy, N. Y.

FILMS; Equipment; Supplies; Send Stamp: Filmcraft, Box 209, Berkeley, Calif.

EXCLUSIVE Rare. Oldtime Home Movies. Giant Lists. only 10c. American Films, 6711-S Sunset, Hollywood 28, Calif.

ART model films 16mm rentals exclusively. adults list. Enclose stamp. Revere Films, Box 1051, Detroit 31, Mich.

FILM with or without processing. Free circulars and samples. Fromaders, Davenport 5, Iowa.

52 MUSIC, MUSICAL INSTRUMENTS

SWISS Musical Units \$3.—Music Boxes, 131 West 42nd, New York 18.

BARGAINS: Harmonicas—Instruments—Catalog 25c. Musician's Shop, 2 E. Centre, Baltimore 2, Md.

53 SONG WRITERS

SONGWRITERS: Send Poems for Free Examination and Outstanding offer. United Music, 116, Salem, Indiana.

POEMS Wanted to be set to music. Free examination. Send poems. McNeil, Master of Music, 510-PS, S. Alexandria, Los Angeles, California.

SONGWRITERS. Songs Published Monthly. Advance Royalty. Send your songs or poems today for our exciting offer. Hollywood Tunemasters, Dept. 10F-C, 1537 N. Vine, Hollywood 28, Calif.

POEMS Wanted For Musical Setting. Send poem for free examination. Five Star Music Masters, 646 Beacon Bldg., Boston.

SONGWRITERS. any raw deals; write me, U.S.J., Room 301, 323 West Polk Street, Chicago, Ill.

EXTRA Special! 1000—Names—Addresses Songwriters—\$1.00—Popular Advertising Company—Box 927—Atlanta, Georgia.

SONG-Poems. titles wanted. Outstanding proposition. Send material today! Special Service, 2115-P Kenilworth, Berwyn, Illinois.

SONGWRITERS! Outstanding ethical offer. Hibbeler, C-15, 2157 N. Avers, Chicago 47.

POEMS wanted for musical setting. Send poems for Free examination. Hamann Service, 626 Manhattan Building, Milwaukee, Wisconsin.

FREE examination. Send Poems. Broadway Song Service, Room 1208-PS2, 1650 Broadway, New York City.

POEMS Wanted. Splendid Offer. Rush Poems. Radio Composers, WDH, Clinton, N. C.

54 RADIOS, SUPPLIES & EQUIPMENT

MAKE Simple. Tubeless. Batteryless. Distance-Getting Crystal Radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-S. Clinton, Mo.

FIX any radio. Amazing new instrument locates radio troubles double quick. Simple instructions show you how. Thousands now in use. Write today for Free 28-page illustrated technical manual, "The Inside Story". Feiler Engineering Co., Dept. 3PS9, 945 George Street, Chicago 14, Ill.

BUY Everything at Wholesale Prices! Radio parts, equipment for the amateur, service man and experimenter. Lowest prices anywhere. Write Mid America, Dept. C-20, 2412 S. Michigan, Chicago 16, Ill.

NAVY-Surplus TBY. Walkie-Talkie 28 to 80 Mc. Separate receiver and transmitter. With tubes less batteries \$19.00. Cost government over \$300.00. Send \$5.00 deposit. balance C.O.D. Van Sickle Radio, Indianapolis 6, Indiana.

HALLICRAFTERS National, other short-wave, television receivers wholesale. Terms. On Trial. Write, Henry Radio, Butler, Mo.

HEARING Aids—Used. Working Order \$14.95. others for parts \$4.95. Any single part \$1.00. Payless, 19 So. 4th, Minneapolis.

TELEVISION—Sharp and Clear. Adjust present aerial. Build low-cost Precision Antennae. Complete instructions, troubleshooting chart, diagrams, construction plans, dimensions, no mathematics. Prop-san's, Lumberton, N. J.

TELEVISION, radio, tubes, parts. Send for free bargain list. Hallmark, 594 Communipaw Ave., Jersey City, New Jersey.

27 YEARS experience Radio repairing. Simplified system. No calculations. No formulas. Total price \$2.00 postpaid or COD. Ross Radio, 14615 Grandriver, Detroit 27, Michigan.

FM on old radios! Free Data! Topical Empire, 1527 Highland, Box 42 C, Louisville 4, Ky.

8 SIMPLE. Unusual Circuits: Amplifying crystal, 1 triode superhet, powerline telephone, etc. 25c. W2PJV, Owego, N. Y.

MAKE Crystal Radio "Boosters". Ten times volume! Designs, instructions. Catalog, 25c. Radio Leader, LaVerne 6, Calif.

HEADPHONES. Guaranteed U.S. Signal Corps used Double Headsets with Adjustable Leather Headbands and Black Bakelite Earphones. Reg. \$3.00. Special now \$1.49. Allen Radio, Dept. HPS, Clinton, Mo.

56 BUSINESS OPPORTUNITIES

\$25 WEEKLY working two hours daily. No canvassing. No Manufacturing. Lycke, Box 2471, Cleveland 12, Ohio.

137 PLANS to make money local, mail order. Particulars free. Elite Co., 220-A Grand St., N. Y.

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late methods. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. E, Decatur, Illinois.

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

A FACTORY in your home garage! Mfg. and sales rights, mechanics' waterless hand cleaner, \$500-\$800 monthly. No special equipment necessary. Formula free. Western Aircraft Mfg., Dept. G, Los Angeles 6, Calif.

PLASTIC Tablecloth Covers, Curtains, Drapes, Baby Pants, Bowl Cover and other Plastic Articles selling like wildfire! Make big money now! Free Details. Write L & M Co., Dept. 59-N, 510 St. Charles, St. Louis, Missouri.

MAKE \$5,000 or more a year in advertising. Be your own boss. No experience necessary. Learn how. Write N.A. Advertising, La Grange 6, Indiana.

ENVELOPES addressed accurately, reasonably. Fast Service. We have capable addressers in your city. Glenway System, 5713-Z Euclid, Cleveland 3, Ohio.

HOME Business making statuettes, plaques, artificial marble, rubber molds. Metallizing baby shoes. Silvering mirrors. Formulas. Folder free. Creative, 236-M, Winnetka, Illinois.

START Mailorder Bookshop—Everything furnished, 25c brings booklet, samples, exciting ideas. General Publications, Ossining 1, New York.

TRAVEL Anywhere! Anytime. Earn \$85.00 week up. No experience necessary. Literature free. Travel, LaGrange 2, Ind.

MAKE money addressing envelopes. Our instructions reveal how. Glen Glenway, 5713 Euclid, Cleveland 3, Ohio.

SAVE Money. Get all bronze baby shoe supplies from one source. Prompt deliveries. Low costs. All types of mountings—book ends, ash trays, pen sets; plating compounds, equipment. Also complete course in electroplating baby shoes that shows easy way to start profitable business in spare time at home. Read details page 90 this magazine. Send name for free facts. Warner Electric Company, 1512 Jarvis Ave., Dept. C-23, Chicago 26, Ill.

MAKE Money spare or full time, casting Metal Toys and Novelties. Latest scale model Autos. Original Ashtrays, Savings Banks, Water Pistols, etc. Enormous wholesale and chain store demand keeps manufacturers busy. No experience or special piece necessary. Write for details and illustrations of patterns needed. Metal Cast Products Co., Dept. E, 1696 Boston Road, New York City 60, N. Y.

OWN Mirror Shop. Resilver Mirrors. Glass Sign Making. Electroplating. Supply Prices. John Sprinkle, V90, Marion, Ind.

PROFITABLE Home Business. Six Plans 25c. Levine's, 15-PS Boulevard Station, New York 59, N. Y.

VENDING machines earn big money! An investment as low as \$10.50 will start you in this fascinating, profitable business that can lead you to the road of success and independence. Routes can be established and operated in either full or spare time with no experience needed. Write for full details and our Free catalog illustrating our nut, candy, gum and stamp vendors; also pin ball machines, music boxes, etc. Write immediately to Parkway Machine Corporation, Dept. 9, 623 W. North Avenue, Baltimore 17, Maryland.

INVESTIGATE Foot-Pals, extra pay checks, sample, information free. Brown Co., Box 126, Salt Lake City 8, Utah.

ELECTROPLATE on non-metals. Instructions \$1.00. Four ampere plater \$19.95. Eight ampere \$29.95. 30 ampere \$85.00. Kissel Electric Products, 431 Sherman, Galion, Ohio.

LEARN Piano Tuning. Repairing at home. Tremendous field! Piano parts, tools furnished. Established 1935. Empire School of Piano Tuning, Champaign, Illinois.

BUY nationally advertised merchandise for others; radios, appliances, etc. Low wholesale prices. Make commission each purchase. Up to \$5,000 year possible. Easy, fascinating new business. Free information. Cox, Saugus 9, Mass.

FREE Folio—400 Money Making deals. Business plans. Schemes. Formulas. Formico Prod., Box 572, Dayton, Ohio.

METALLIZE Baby Shoes. Repair Dolls. Make Rubber Stamps. Silver Mirrors. Make Plaster Novelties. Catalogue of "39 Ideas" Free! Universal, Box 1076-B, Peoria, Ill.

LIQUID Rubber, make flexible molds. Free Sample. Chaney, 1130 E. 18th St., Jacksonville 6, Fla.

OWN-operate Cigarette Vending Machines in hotels, taverns, garages, etc. 6-column machines, price \$59.50 each. 9-column machines, price \$90.00 each. Peanut and Ball Gum Machines, \$13.95 each. Immediate delivery. Write for free circulars. Cameo Vending, 432 West 42nd St., New York.

POPCORN Machines. Potato Chip outfits. Long Eakins Co., 4863 Hi St., Springfield, Ohio.

MAKE flexible molds! Cast plaques, novelties, bookends! Free sample! H. Tooker, Hamilton 7, Ohio.

COLORGLAZED Concrete Pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, Minnesota.

QUICK, sure money, selling Annie Blain Flavors, Highland Park 16, N. J.

BRONZED Baby shoe mountings and supplies. All metal bronze bookends, picture frames, ashtrays, etc. Onyx ashtrays, desk sets, plaques. Hardening solution, 30-amp plating rectifiers with powerstat control, \$85.00. Geared motors for agitation \$20.00. Lead lined tanks. Write for list. Hollywood Bronz Supply, Dept. S, 1770 N. Vermont, Hollywood 27, Calif.

EXCEPTIONAL Money Making Opportunity for live-wire Distributor. Dealer's county franchise now available for fast selling, low-priced fire extinguisher and alarm. Made of glass, modern as tomorrow. Tremendous market. Big profit. Write for full information. Autolystop Co., Dept. C-3, 2035 Washington Ave., Philadelphia 46, Pennsylvania.

MAKE money from own home by mail selling office supplies. Tremendous demand. Snyder, 5-F Spring, Beachwood, New Jersey.

HALF Million articles Wholesale. Directory 25c. Publisher's Box 1302-A3, Detroit 31.

NATURAL molding latex. Extra thick. Free Sample. W. Wooley, 115-B Donald, Peoria, Illinois.

EARN \$50.00 or more weekly operating a route of nut and gum vendors, slot machines, stamp vendors, etc. in your spare time. No experience necessary. Details free. Danco Coin Machine Co., Dept. PS 1304 E. Baltimore St., Baltimore 31, Md.

SELECTED Collection Proven Money Making Plans. Home-Mail Order. 6th Edition. Particulars Free. Flasco Sales, 2505PM 150 St., Flushing, New York.

"ELECTROPLATING Know-How"—get the professional know-how of modern electroplating, fascinating money making field, simply and quickly! Write for free illustrated booklet. Joseph B. Kushner, Electroplating Engineer, Stroudsburg 22, Pa.

I MAKE big money in the mail-order business. You can do the same at home with copyrighted system. Write me, I'll tell you how. P. Little, RD # 1, Glenshaw, Pa.

QUICK Money! "Repairing Car Batteries." At home! Easy too! Batteryman, Grand Junction 1, Colorado.

MAKE Money At Home Like I Do! Free Details. Duffy, Covington 5, Kentucky.

MAKE Money By Mail. Howard, 1778-B Hamburg St., Schenectady 4, N. Y.

FREE Course casting novelties at home. Big profits. Write. Major Chemical Company, 131 Inman Street, Cambridge 39, Massachusetts.

GLASS-Cast: New and Finest Liquid Plastic on the market. Cold set, 15 to 30 minutes for finished product. Free Instructions. Easy to make novelties, toys, jewelry, machinery parts, etc. \$2.50 per quart. Elastomold: Flexible, transparent, permanent production molds made in 20 minutes. Free details and samples on request. Also quality rubber latex. Wholesale Prices. Plastic Service, 294 Washington St., Room 813, Boston 5, Mass.

REAL money making opportunity making Interlocking Concrete building blocks. Rex Products Co., Dept. 21, Piqua, Ohio.

OPPORTUNITY Seekers Everywhere. Make More Money by Mail! Here's How You Can Start at Small Cost. Get These Facts First. Free Details. Gold Seal Mail Order Service, 509-A So. Harris St., South Bend 19, Indiana.

MAKE Tough plastic 1c pound. Makes durable floors, walls, mantels, roofs, 101 uses. Build attractive home yourself. Material cost \$150 room. Bays Laboratory, Oklahoma City 9.

FREE plans. Three dimensional composite pictures easily made. No experience. 500% profit. Stamp appreciated. Tri-View, 5009 Sunset, Los Angeles 27.

TRADE and Class Magazines. Keep posted. Latest Single copies. Over 1000 covering every trade, business and interest. Price list Free. Commercial Engraving Publishing Co., 34S North Ritter, Indianapolis 19, Indiana.

WE Need More Live-Wire Rototiller Dealers . . . to handle the well known, nationally advertised Rototiller. This machine is a leader in its field . . . a demonstration usually means a sale. Occupies small floor space. Many owners say Rototiller pays for itself in one season. Big dealer profits on every machine plus profits on attachments. Small investment puts you into the Rototiller business. Why don't you, too, make big profits in '49 with Rototiller. Write or wire Frazer Farm Equipment Corp., York, Pennsylvania. A Division of Graham-Paige Motors Corp.

OPERATE your own Photographic Business. Sales terrific! Cameras, projectors, enlargers, darkroom equipment, accessories, etc. Free details. Peace Products Co., Dept. 500, 152 West 42nd St., New York City.

MAKE Hollywood Style marble glazed cement pottery, birdbaths: Home—Shop. Benches, mantels, stucco—rock walls, garden ornaments: chemically colored. Dine brings sample, amazing pictures. Hollywood Cementcraft, 8527-B Wonderland, Hollywood 46, Calif.

HOUSE Paint—Wholesale \$2.70 gallon. Agents wanted. Free advertising offer. Certified Products, 812P, 38th, Louisville, Ky.

INCOME From leisure hours—Coin operated radios work for you day and night in cabins, hotels, etc. Write today for special offer bulletin. Box 150, Manchester, N. H.

START Home plaster novelty business. Amazing course tells how. Literature free. Kemo-Courses, Dept. B, 4862 W. Catalpa, Chicago 30, Ill.

BRONZING baby shoes is big business—Start your own business for \$4.95 total cost materials and instructions—no equipment required. Particulars free. Metal-sealed, Box 2095, Wichita, Kansas.

MAILING postcards selling repeat merchandise is profitable. Everything supplied. Details free. Gordon Publishers, Box 23, Pawtucket, R. I.

METALLIZE Baby Shoes. Excellent profits. New system assures success. Free details. Treasures Forever, 89-B Henry Ave., Lynn, Mass.

\$5.00 PER Hour Metalizing baby shoes. Original "go in business on a shoe string" Success plan offers New way to Big Profits at home full or spare time. Complete details Free. Send postcard Now. Kiktavi Co., 2111A W. Manchester, Los Angeles 44.

BIG money. Spare or full time in your home. No Selling! Spray New Miracle Finishes. Plush and Suede, on signs, radios, automobiles, figurines, lamps, toys, etc. Our business is booming—new easy Flok-Kraft methods—material costs few pennies. You get dollars. Free samples, complete powerful money making plan free. Write now: Coast, 1515B West Manchester, Los Angeles 44.

KNOW the facts before investing in Mail Order. Send for "The Mail Order Counsel Book"—\$2.00. You'll get, absolutely Free—"How to Sell By Mail" (worth 25c). Write today for free literature. Maule's, 1007 13th St., Niagara Falls, N. Y.

PLASTERCRAFT Course and illustrated catalog of complete supplies free on request. Jayhawk, Blue Rapids, Kansas.

HERE is your opportunity to be successful. Sell essential supplies and equipment to restaurants, clubs, hotels and institutions. Opportunity to make \$10,000-\$20,000 yearly. No investment. Complete catalog for each customer. Openings in North, South Dakota, Nebraska, Kansas, Colorado, Minnesota, Iowa. Dimple Supply Co., Inc., Box 708, Sheridan, Wyo.

GLUE. 26 easy recipes \$1.00. Nunn, 659 E. Oxnard, Calif.

\$46 FROM Square Foot Plywood; Jigsaw necessary. Write; Woodart, Bridgewater, Massachusetts.

\$3.41 PROFIT per hour interest you? Easy, amazing process velvetizes interiors, signs, novelties, radios, lamps at low cost. Free sample. V-Sparks, 1145 Queene Anne, Los Angeles 6.

BABY Shoes preserved. Formulas, instructions \$1.00. Novelty Bronzing, Box 56, Hyde Park 36, Mass.

ELECTROPLATING Instructions, and formulas for Brass, Copper, Cadmium, Chromium, Nickel, Gold and Silver plating. All for 25c. S. Hyde, Box 2099—Station V, Los Angeles 3, California.

"KURL-Keep"—Every Mother saves lock of baby's hair. Cash in on this custom with America's newest money-maker! Seal Baby's hair, snapshot, name, birthdate, forever in sparkling plastic! Every parent a "Kurl-Keep" prospect. Assemble quickly at home, full or part time, show to buyers, profit! Mount in lamps, bookends, etc.—Make even more! Starting outfit: Plastic, plaque, frame, instructions, profit tips—\$1.98 plus postage COD; \$2.00 postpaid. Satisfaction or money back. Fascinating! Profitable! Order "Kurl-Keep", now, Birchcraft, 5763 Belmont, Cincinnati 24, Ohio.

GOODYEAR rubber for molds, 75% solids malaya rubber, trial half pint \$1.00. Write Goodyear, Lake Geneva, Wisc.

HOW and where to obtain Capital? Free details. Star Service, Wapakoneta, Ohio.

SAWDUST. Turn it into cash. Six methods. Instructions 25c. Charles, 12-EX, Norwood, Ohio.

MAKE money making new greaseless doughnuts at home on electric machine. Wholesale to grocers, drug stores, cafes, hamburger shops. Send for free recipes and plans. Ray Do-Nut Company, 3605 South 15 Ave., Minneapolis 7, Minnesota.

METALLIZING Baby Shoes. easily learned. Free Details. Houghton, 8 Mt. Vernon, Charlestown 29, Mass.

YOUR Home Or Garage Has Space needed for mfg. new mechanics hand cleaner, \$500-\$750 monthly. No machinery needed. Exclusive territory. Trademark and formulae free. Tiffany Products, 289 E. 6th, St. Paul, Minn.

INCOME from local information. Interesting. Sparetime. Neher Company, La Verne 6, Calif.

WOULD you pay 3¢—first \$350 make? Color-illustrated book "505 Odd, Successful Enterprises" free! Work home. Expect something odd! Pacific, Oceanside, Calif.

1000% PROFITS Making 8 scarce materials for building boom. \$1.00. Enterprises, 157 Goldale, Toronto, Canada.

37 MONEY MAKING OPPORTUNITIES

DETECTIVES Earn Big Money. Experience unnecessary. Particulars free. Waggoner, P-125, West 86th, N. Y., N. Y.

\$1.00 GETS you 21 money-making popcorn, candy apple formulas. We supply equipment. Concession Supply Company, Dept. B, Station "B", Toledo, Ohio.

NO selling. operate coin machines, amazing profits, details Free. Parkway Corporation, Dept. 18, 623 W. North Avenue, Baltimore 17, Maryland.

PROFIT with Larson Leathercraft. Belts, purses, 100 other ideas. Largest supply in U. S. Catalog 10c. Larson, Dept. C, 826 S. Tripp, Chicago 24.

NOW available! 1949 Edition of Official Concessionaire's Guidebook. Jam-packed with money-making ideas, games, formulas, equipment for concessions, roadside stands, carnivals, medicine business, etc. Buyers Guide. Send \$1.00 today for copy. Concessionaire's Guidebook, Box 133A, Sta. B., Toledo 6, Ohio.

CANDY Manufacturing and marketing. complete course \$6.00, literature 10c. Philip Pate, Kissimmee 2, Florida.

"EVERYBODY Likes Candy." Learn to make in a professional manner. (Our 39th year.) Ragsdale Candies, D10, East Orange, N. J.

PRIZE Contest Fans Reap Rich Rewards. Enclose 3c stamp. National Contest Bulletin, 1609 E. 5 St., Duluth, Minn.

EARN money at home! Thousands do! "Home Worker Magazine" tells how. Sample, 25c. Sizemore, Box 6, 4917 Kostner, Chicago 30, Ill.

"THIS Is It!"—Learn Sewmachine Repairing, plus profitable installing our motor kits, etc. Write—Taylor Service Co., Hamilton 2B, Ohio.

METALLIZING Baby Shoes Makes You Money: Write Today For Your Free Copy Of My New "Guide To The Baby Shoe Metalizing Business". Joseph B. Kushner, Metal Finishing Engineer, Stroudsburg 22, Pennsylvania.

MONEY-making how-to-do-it books for new independent business ventures. Send for free list. Adar Nissan Associates, 400 East Tremont Avenue, New York 57, N. Y.

\$12.00 PROFIT on 25c investment. Complete Information 25c. Sunrae, Ogema, Wis.

UNPAINTED figurines. Illustrated list Free. Oman, 642 Broadway, St. Paul 1, Minn.

15 MINUTE Advertising and Sign Lettering Course; Sign Painter's Secrets; Cartooning Book; All Three \$1.00; Free Circular. Abenterprises, Box 875-S, Peoria, Illinois.

CHEMICAL Gardens. Eleven recipes \$1.00. Nunn, 659 E. Oxnard, Calif.

EARN Money Evenings. copying and duplicating comic cartoons for advertisers. Adservice, Argyle 2, Wis.

85% OF graves are unmarked! You can make an imitation granite grave marker, selling for as much as \$40.00, in one hour, completely lettered, materials cost less than \$1.00. Complete information 25c. Cast-Stone Products, Box 498, Gainesville, Texas.

MAKE big Money—Distributing—New— Illustrated Joke Booklets. Samples, Details, 25c. Kogan, 1032-MO, Church Annex, New York 8.

SEE "Kurl-Keep" advertisement under "Business Opportunities"—Fascinating new money-maker!

500 MONEY Making Tips, Ideas, Formulas, Schemes, Plans, Folio Free, Formico Crafts, Box 572, Dayton, Ohio.

GROW Goldenseal, Roots Bring Fortunes, Circular Free, Liberty Seed Co., 24 Liberty, Patchogue, N. Y.

FOR "Speedy Income by Mail" Write Immediately, Terrill, Bogard 1, Mo.

INCREASE Your Earnings; Local Business Opportunities; Mail Order Information; Wholesale Supply Sources Valuable Money-Making Tips; Information, Free details, Rush name, Wilkin Company, Hillsboro 2, Ohio.

\$247.50 making new secret device from pre-fabricated surplus costing \$1.50! No experience, machinery. Amazing indisputable proofs free! Rolls Enterprises, 115 West 16th, N. Y. 11.

1000 ASSORTED sequins, matching beads, 40c. Free jewelry instructions, supplies list, Fast service, Betty Kay, Box 274-PS, Ridgewood, New Jersey.

HOUSEWARES items, Sell on sight, Every home a prospect, Men, women, boys or girls... make big money with these hot sellers, Write for circulars, Kooper Kraft, Box 8-S, Terre Haute, Indiana.

WOULD You pay 3¢—first \$350 made? Color-illustrated book "505 Odd, Successful Enterprises" free, Expect something odd! Pacific, Oceanside, Calif.

58 FORMULAS, PLANS, ETC.

FORMULAS—All kinds, Latest products, Literature free, Kemico, Park Ridge 15, Illinois.

10,000 FORMULAS and Trade Secrets, Free Literature, Stillmans, 555 Kingston Ave., Brooklyn 3, N. Y.

FORMULAS, Free list, A. Cain, 94 Bedford Avenue, Brooklyn 11, New York.

GET Free Formula Folio, 500 money making ideas, Schemes, Exposés, Formico—Na, Box 572, Dayton, Ohio.

INVISIBLE Inks, Appear by Chemicals, Ten recipes \$1.00, Nunn, 659 E. Oxnard, Calif.

LABORATORY tested formulas, Lists free, Pont, Box 635-PS, Terre Haute, Ind.

59 PLASTICS

LUCITE, Plexiglas, All size sheets, Cost square foot (12" x 12") 1/16" 96c; 1/8" \$1.25; 3/16" \$1.52; 1/4" \$1.80; colors add 10%, Include 10% postage, Almac Plastics, 230 Fifth Avenue, New York 1, N. Y.

INTERNAL carved roses, orchids, swans, goldfish, butterflies, etc. Jewelry and gifts, Crystal Floral Novelty Co., Bound Brook, New Jersey.

PLASTICS—Supplies, findings, shells, Illustrated fabricating manual, bargain catalog, 10c, Gem-O'-Lite, Box 5350G, North Hollywood, Calif.

PLASTIC, Sheets, Rods, Tubes, etc. Free List, Plastic Supply Co., 2901 N. Grand Blvd., St. Louis 7, Mo.

INTERNAL Carvers! Beautifully finished Pin & Earring Blanks, \$1.00 sample set, includes findings, gift box, Many shapes, also cigarette boxes, coasters, paper weights and other beautiful gift items, ready for carving, Catalog, Jamer Corp., S-1, Manufacturer, 22 E. 21 St., New York 10.

PLEXIGLAS—12" x 12" Masked Sheets, 1/16"—\$1.00, 1/8"—\$1.25, 3/16"—\$1.55, 1/4"—\$1.85, Includes 10% postage, Dyes, Rods, Tubes, Luminous Powders, Carving blanks, Drills, jewelry findings, Free Catalogue, Craft Plastics, Somerville 2, N. J.

PLEXIGLAS—Write for Free Price List, The Unique Glass Shop, 309 Cowardin Ave., Richmond, Virginia.

CHEMI-Glas! Inexpensive water-clear casting resin, Pamphlet, 25c, Technicraft, 1156 Commonwealth, Boston 34, Mass.

60 CHEMICALS AND APPARATUS

NEW Idea Chemical and Apparatus Outfits for Home Experimenting, Photo-Scales, Semi-Professional Microscopes and Biological Supplies, Specializing in chemicals and laboratory supplies in small quantities, Send 15c for Catalog, Established 1931, John H. Winn, 124B West 23 St., New York, N. Y.

CHEMICALS and apparatus for industrial, analytical, and private laboratories, Catalog 15c, Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 7, N. Y.

VACATING Laboratory, Selling Chemicals, Apparatus, Particulars on Request, Ted Dudzik, Whiting, Ind.

CHEMICALS, Ounce Quantities, Catalogue 10c, C-L Company, 4634 Garfield, Minneapolis, Minn.

NEW catalog: Chemistry, mineralogy, biology, physics 10c, Tracey Laboratories, Evanston, Ill.

NEW Laboratory supply catalog of Chemicals and Apparatus, Contains many thousands of items with illustrations, Send 25c, Standard Science Supply Company, 1232 N. Paulina St., Chicago 22.

EQUIPMENT, chemicals, Send 5c, Atlantic Laboratory Supply, 21 Wenham, Boston, Mass.

61 HELP WANTED

ALASKA, The Last Frontier offers unlimited opportunities, \$1 brings government map and Directory listing firms in Fishing, Construction, Mining, Aviation, Fish & Game rules, Homestead data, Alaska Opportunist, Box 883-S, Hollywood 28, Calif.

CONSTRUCTION Report—Send \$1.00 for World Wide Job Project Listings, Up-To-Minute Facts for Construction Men, Global Reports, P. O. Box 883-PX, Hollywood 28, Calif.

RELIABLE man with car wanted at once to call on farmer, Wonderful opportunity, \$15 to \$20 in a day, No experience or capital required, Permanent, Write today, McNeess Company, Dept. 140, Freeport, Illinois.

BOYS Wanted, Over \$2.00 hour! Sell name plates for front doors, Free Sample, Write Dept. 64, National Engravers, 214 Summer, Boston, Mass.

INTERESTED In Latin American & Foreign Employment??? \$1.00 brings Foreign Service Directory listing Oil, Construction, Mining, Aviation companies, Exporters and Importers, Hot tips for applications, Global Reports, Box 883, Hollywood 28, Calif.

FOREIGN Employment?? Bulletin, Application forms and overseas directory—\$1.00 (C.O.D.—\$1.28), Foreign Service Institute, P.O.B. 3980, Miami 24-A, Florida.

WANTED—Men & Women spare time workers, Fast, Easy, Extra Money for you, Samples and working details 25c prepaid, Liebig Industries, Beaver Dam, Wisconsin.

MAKE \$20 a day! Complete line, Door name plates, knockers, numbers, Hub-stamp, 357-B Congress, Boston, Mass.

MEN-Women mail circulars spare time at home, Good pay, Mail 25c for samples, Instructions! Hoservice, P.S.-905, 1418 Walnut, Philadelphia 2.

62 AGENTS WANTED

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late method, No tanks or shop required, outfit furnished, Free Booklet, Gunmetal Co., Ave. G, Decatur, Illinois.

EXCELLENT Sideline for printing and advertising salesmen, Decalcomania name plates in small quantities, Great demand, Also, make money with our line of Automobile Initials and Sign Letters, Free Samples, "Ralco", XL-Roxbury, Boston 19, Mass.

AGENTS—300% profit selling genuine gold window letters; stores and offices, Free samples, Metallic Letter Co., 437 N. Clark, Chicago.

MAKE more money selling personal initialed individualized belts, buckles, cap badges, tie holders, name plates, 2,000 emblems to choose, Big profits, whole or part time, Write today—special outfit order, Hookfast Specialties, Box 1425, Dept. 7, Providence, Rhode Island.

FREE water and our concentrates make flavors, lotions, shampoos, 125 products, Labels, bottles supplied, Qualco, F-20030 Russell, Detroit.

GOLD lacquered Window Sign Letters, Large Sizes Penny Each, New Foils, Absolutely Beautiful, Free Samples, Atlas, 544 W. 79th, Chicago 20.

ABSOLUTELY Free! Big package actual sample fabrics and style presentation of dresses, lingerie, hosiery, etc. Take orders, Commissions big, Send no money, Melville Co., Dept. 4780, Cincinnati, Ohio.

A DRESS for You with every 3 you order for yourself and family, Amazing new plan, Everything Free, Harford Frocks, Dept. A-9129, Cincinnati, Ohio.

SELL By Mail Books, Novelties, Bargains! Ready Made Circular Service! Large Profits! Catalog Free! Ellico, 432 North Wells, Chicago 10.

SCHOOL Seniors—Earn 40% commission selling classmates America's Most Beautiful Graduation Name Cards, Largest selection, Outsells all others, Free sample kit, Printcraft, Dept. M, 1425 E. Elm Street, Scranton 5, Pa.

AT last! Something new and sensational in Everyday Cards, Gorgeous satin and velour designs, Get orders fast, Big profits, Imprinted Stationery, Floral Charmettes, Napkins, 25 assortments for all occasions, retail 60c to \$1, Samples on approval, Puro Co., 2801 Locust, Dept. 941-C, St. Louis 3, Mo.

MAKE Money Calling on Friends, Show Greeting Card Assortments—Birthday, Get-Well, others, Floral Stationery, Gift Wrappings, Experience unnecessary, Samples on approval, Wallace Brown, 225 Fifth Ave., Dept. P-4, New York 10.

START Your Own Business On Our Capital, Always your own boss, Hundreds average \$6,000 to \$25,000 annual Sales year after year, We supply stocks, equipment on credit, 200 home necessities, Selling experience unnecessary to start, Wonderful opportunity to own pleasant, profitable business backed by world-wide industry, Write Rawleigh's, Dept. C-U-PSC, Freeport, Ill.

NEW Jobs Open In Selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time, No experience needed, Opportunity, 28 E. Jackson, Dept. 18, Chicago 4, Ill.

FREE Samples, Big profits showing amazing Glow-In-The-Dark specialties, House numbers, pictures, plastic novelties, religious and nursery objects, etc. Large manufacturer, Madison Mills, 303 Fourth Ave., New York, N. Y.

SELL New-Used clothing home, auto, store, Men's suits \$1.25, Leather Jackets 85c, Overcoats 56c, Dresses 18c, Ladies' coats 38c, Other Bargains, Catalog Free, S & N, 565H Roosevelt, Chicago.

SELL ultra-blue stock signs to stores, 1000 slogans, comedy, general, religious, "7x11" cost 6c—Sells 35c—Make money, 15 samples Ultra-blue signs "7x11"—\$1.00 postpaid, L. Lowy, 8 West Broadway, Dept. 451, New York City 7.

FREE Nylons given if Kendex hosiery runs or snags! World's only women's hosiery sold with written guarantee amazing everybody, Mere words could not express unbelievable money making opportunity, Fantastic earnings become reality, Armstrong earned \$202 in 9 days, Watkins sent 92 orders in one day, Imagine replacing hosiery free regardless of cause—whether use or abuse! Truly sales dynamite for terrific profits, Even if you never sold before, three magic words: "Guaranteed Against Everything" will open doors for you—make women listen and pour money in your pocket, Complete line from sheerest to service (15-20-30-40-60 denier) all lengths 28 to 35 inches—latest colors—seamed full fashioned and seamless, No competition because Kendex guaranteed nylons not sold in stores, Also complete line men's hosiery actually guaranteed for one full year! Nothing like this anywhere, Includes rayon, nylon, lisle, wool, cotton, mixtures, etc. All styles, patterns, colors, prices to please everybody, Thousands shipped daily, 100,000 pairs constantly in stock for fast delivery, Over 30 years in business, You need no money or experience, Nothing to pay now or later, Show free outfits, Write orders, We deliver and collect, Big advance cash plus huge bonus, Earn money spare or full time—exclusively or side line, No restrictions, Become manager—appoint others to sell for you—earn steady income on their sales, Complete money-making outfits including salesbooks in color, samples of hosiery materials, etc. furnished free and prepaid, Simply mail name and address to: Kendex Company, Babylon 34, New York.

HUGE Profits with Decals, Sales unlimited! Every store, repair shop and manufacturer a customer, Most outstanding line of decal name plates, letters, numerals in country, Write for free sales kit, Midwest Decalcomania Company, 525 West 76th St., Chicago 20, Illinois, Dept. PS-3.

SELL Slot Machines, Games, Home Bars, Send for wholesale deal, Webb Distributing Co., 4958 W. Chicago Ave., Chicago 51, Ill.

SCHOOL Seniors!!! Your postal will bring our wonder. Kwick-Sell Cardalog of popular Graduation Name Cards. Biggest profits!!! Only firm giving free souvenir chest and Card Case. Don't miss out! Hurry that postal!!! Craftcards. Box 235 (M). Pittsburgh 30. Pennsylvania.

BUY Thousands of Nationally Advertised Products Direct from Manufacturers. Write for "Buy Direct and Save". Consumers Assn., 218-G Investment Bldg., Pittsburgh 22. Pa.

AMAZING offer—\$50.00 is yours for selling only 100 boxes entirely different, new DeLuxe All-Occasion cards. Patented feature television card included. Each box sells for \$1.00, your profit 50c. Surprise items. It costs nothing to try. Write today for samples. Cheerful Card Co., 585 White Plains, N. Y.

LOOK! Special money-making opportunity! Profits to 100%. Bonus. Sell irresistible All Occasion greeting card assortments, new style gift wrappings, plastic cards, exclusive stationery. Special offers. Request free Name Imprinted and Floral Stationery samples and All Occasion boxes on approval. New England Art Publishers, North Abington 103. Mass.

EXTRA cash income. Sell friends new, different greeting card assortments, exclusive stationery unobtainable elsewhere. Profits to 100%. Bonus. Request free samples exclusive personalized stationery and All-Occasion samples on approval. Regal Greetings, PS-6 Hazel Park, Michigan.

DOUBLE Duty Shopping Bag. Zips open. Instantly changes from small to large size. Lightning seller. Samples sent on trial. Kristee 116. Akron, Ohio.

EARN many dollars now with Thomas Terry's Amazing New Springtime and Year 'Round Plans. Send today for two unusual assortments on approval and New Free Display Folders. Write Thomas Terry Studios, 200 Union Ave., Westfield, Mass.

NEW "Sponge" Dish Cloth. Replaces messy dishrags. Banishes dishwashing drudgery. Lightning seller. Samples sent on trial. Kristee 117. Akron, Ohio.

POCKET Pal: Replaces Pocket Knives. New, Safe, Beautiful. Always razor sharp. 50c seller. 321% profit. \$15.00 or more daily. Agents, Salesmen, Distributors. Sample 10c. Nelson Mfg. Co., 222 W. Kellogg, St. Paul 2, Minn.

\$6.00 HOURLY showing Firestone Velon handbag—opens into large shopping bag. Fastest seller in America. Women buy several for gifts. Commissions advanced daily. Sample furnished. LeNard, 179-D Washington, Chicago 2.

MAKE \$50.00 selling America's leading All Occasion greeting card assortments. Samples on approval. Complete line fast money makers—gift wrappings, place cards. Free samples imprinted and monogram stationery. Write Lorain Art Studios, Dept. AP, Vermilion, Ohio.

HERE'S easy extra money for you. Greeting cards. Masslinn napkins. Towels, utility purse-shopping bag, etc. Show New largest most beautiful greeting card line of all time; all-occasion, birthday cards, gift wraps, etc. New bonus plan earns you up to & over 100% profit. Name-imprinted & personal monogrammed stationery samples Free. Write Now, Dept. PSC3, Pen-Brush, 139 Duane St., N. Y. 13.

BE renewal headquarters for all magazines. Handle everything at home. Big profits. No experience. No capital needed. Free Catalog tells how. Write McGregor Magazine Agency, Dept. 139, Mount Morris, Ill.

I'LL Put A "Shoe Store Business" In Your Pocket! Nation's Leader trains you to make Big Money! Fit men, women. Free Sample Outfit—Write Today! Victor Thomas Shoe Company, Dept. V-300, Chippewa Falls, Wisconsin.

EVERY kitchen floor needs High Shine Windsor Wax. Convince yourself! For one pint sample, send only 25c. Complete household wax line also available. Some territories still open. Hurry! Hurry! Windsor Wax Co., Dept. P.S.-5, Hoboken, N. J.

PERSONALIZED Paper Products. Greeting Cards, Gift Wrappings, Stationery. Raum, 4154b Fifth St., Philadelphia 40.

NEWEST money making sensation. Sell hand painted ties with personal initial. 100% profit. Experience unnecessary. Special offers. Write for free 20 page catalog complete line ties, mufflers, Philip's Neckwear, 20 West 22nd St., Dept. P-32, New York 10.

SENSATIONAL Sales Everywhere with the New Dice and Pokerchip Game. Complete demonstrating Sample \$1.00. Retail \$1.95. Leitner Company, 4031 N. Paulina, Chicago, Illinois.

FAST Money! Take orders for new sensationally different picture enlargements. No competition. Everybody buys. Gotham Products, Box 5427S, Philadelphia 43. Pa.

500 MONEY Making Deals. Wholesale supply sources. Formulas. Folio Free. Formoco Co., Box 572, Dayton, Ohio.

300% PROFITS selling genuine, guaranteed, "NuSilver Polish & Silvering Liquid". Apply with cloth. Stores, offices, homes. NuProcess Products, Aurora, Ill.

SELL!! Balloons, Combs, Specialty Merchandise, Carleton House Distributors, Texas City, Texas.

GUARANTEED Swiss Watches, Jewelry; \$2.00 commission each \$7.50 sale; balance C.O.D. Brooklins, B-1975CC, Little Rock, Arkansas.

AGENTS—Unbelievable. until you have tried this self selling foot bath powder. 98% people need it. 50% profits. Excellent repeater. Rush name for free sample. Saari, 1916-N Sheffield, Chicago 14.

SEE "Kurl-Keep" advertisement under "Business Opportunities"—fascinating new money-maker!

FANS—Fans—Salesmen making \$50.00 to \$100.00 per day selling our electric fans, sump pumps and printed self sticking advertising tape. Write—Universal Fan Co., Inc., Peru, Indiana.

PROFITS. Big demand and repeat orders selling rubber mats for home or auto. Free sales plan. Mitchell, Dept. PS-3, 2140 San Fernando Road, Los Angeles 41.

WOULD you pay 3%—first \$350 made? Color-illustrated book "505 Odd, Successful Enterprises" free! Work home. Expect something odd! Pacific, Oceanside, Calif.

63 HIGHGRADE SALESMEN

LOOK Here! Wanted—Men and women to start in business on credit. Sell some 200 farm-home Products. Thousands our Dealers now make quick sales, big profits. For particulars write Rawleigh's, Dept. C-192-PSC, Freeport, Ill.

SALESMEN. Earn \$100.00 weekly, selling only six pair shoes daily. Commission and bonus. Wide variety for men, women, children. No investment. Experience unnecessary. Tanners Shoes, 411 Boston, Mass.

STOP! Want To Make Money All Year Round Selling a complete line, Uniform Trousers, Shirts, Caps, Ties, Badges, 2000 Emblems, Personal Initialed Buckles, Belts, and hundreds of other easy-to-sell items. Sales Kit furnished. Please write today. Hook-Fast Company, Box 480-PS, Roanoke, Va.

SALESMEN—Put yourself in line for big money and real future. Keep stores supplied with 5c—10c counter goods. Nationally advertised merchandise. Top profits for you and merchants. Liberal deals boost sales. Sideline or full time. World's Products, Dept. 83-P, Spencer, Ind.

MANUFACTURER'S Agents—Hardware Dealers. Power units. Open account. Big demand. Write fully. Farm Products, M-2013, Excelsior Springs, Mo.

SEE "Kurl-Keep" advertisement under "Business Opportunities"—fascinating new money-maker!

67 EDUCATIONAL AND INSTRUCTION

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or Spare time. Details Free. No obligation. Ellis, Box 203, Cedar Grove, North Carolina.

BE a piano tuner. 13,000 needed in U. S. A. Make \$3,000 to \$5,000 each year, full or spare time in this intensely interesting and fascinating work. Experience unnecessary. Easy course qualifies you. Knowledge of music helpful, but not necessary. Approved by Veterans Administration. Penny post card brings free details. Free placement service. Harmony School of Piano Tuning, 147-A N. Cameron, Harrisburg, Pa.

MEDICAL Laboratory Technicians in great demand. We train you in your own home, in your spare time. Also home study course in General Chemistry. Catalogue free. Imperial Technical Institute, Box 973-S, Austin, Texas.

EXPORT! Learn at home from established World Trader. Big paying positions. Your own profitable world-wide business by mail order without capital; or travel abroad. Experience unnecessary. Free booklet. Melinger, 203W, Los Angeles 24, California.

NURSES' Training School. Make up to \$30-\$40 week as a trained practical nurse! Learn quickly at home. Booklet free. Chicago School of Nursing, Dept. M-3, Chicago.

INDUSTRY needs Chemical Technicians. Learn at home from graduate chemists. Laboratory Included. Write for free details. Institute of Applied Technology, 309 Harvard St., S.E., Minneapolis 14, Minn.

BECOME a Doctor of Psychology or Metaphysics. Teach secret of contentment, happiness. Win degree of PsD, or MsD. Solve mental worries. Free book. College of Universal Truth, 5153-K N. Clark, Chicago.

PIANO Tuning Pays. Learn this profitable profession at home. Our Tonometer and mechanical aids make learning easy. No knowledge music necessary. Diploma granted. Largest and oldest school—50th year. G. I. Approved. Write for booklet. Niles Bryant School, 77 Bryant Bldg., Washington 16, D. C.

BE a Mathematical Wizard. Add Columns Instantly. Free Details. Vanderdrift, 517 Lincoln Place, Orange 1, New Jersey.

IF you'd like a profitable office business, operate a collection agency. Our inexpensive, short course quickly qualifies you. Write Cole & Associates, Syracuse 2, New York.

WHY Don't You Write? Writing short stories, articles, etc., will enable you to earn extra money. In your spare time we teach you to write the way newspaper men learn—by writing. Free "Writing Aptitude Test" tells whether you possess the fundamental qualities essential to successful writing. Veterans! This course approved for Veterans Training. Write today! Newspaper Institute of America, Suite 5689-C, One Park Ave., New York 16, N. Y.

WANT U.S. Gov't Job? Big pay—Security. Men—Women earn more. Qualify Now for exams. Free 40-page book. Sample tests. Write Franklin Institute, Dept. M-22, Rochester, N. Y.

LEARN Piano Tuning at home with sound recordings in thirty days. Electric record player, recordings, tools, and instructions furnished. An uncrowded profession with unlimited income. Write today for detailed information. Capital City Tuning School, 211 East Michigan, Lansing, Michigan.

PHOTOGRAPHIC mind! Amaze, earn, learn! Facts, figures, names stick like burrs with Supermemory. Thor Books, 83, Box 1210, Chicago.

SCIENCE of memory simplified. Free booklet "Memory Development." Memory Studio, 2016 Sunnyside Ave., Chicago 25, Ill.

LEARN Graphic Arts in a few months, earn good wages. Hand Composition, monotype, etc. Free bulletin. Graphic Arts Technical School, 1104 Currie Avenue, Minneapolis 3, Minn.

69 CONTESTS

WIN Cash, Cars in Prize Contests! Write for copy filled with current contests, winning hints and tips. Send only 25c. Wright Contest Digest, Dept. 20-C, P. O. Box 2266, St. Louis 9, Missouri.

\$1,000,000 FREE—Contests—Yearly. Win fortune. Winners prepare your entries—lowest cost. Research, 13 Earl Street, Red Bank, N. J.

70 LANGUAGE OUTFITS

LINGUAPHONE Makes Languages Easy. At home learn to speak Spanish, Portuguese, Italian, French, German, Russian, by quick, easy Linguaphone conversational method. Save time, work, money. Linguaphone Correspondence Courses are available to veterans under G.I. Bill of Rights. Send for free book. State if G.I. Linguaphone Institute, 54 RCA Bldg., New York 20, N. Y.

SPANISH Quickly, with Speed-O-Way Records. Complete course \$7.95. Free Folder. Speed-O-Way, Dept. 112, Box 2301, Houston 1, Texas.

72 AUTHORS SERVICE

SPECIALIZES Revision, rewriting, typing, expert preparation of short stories and novels for marketing. Tinney, 3111 Arizona, Dallas 16, Texas.

I WANT New Writers to cash hundreds of checks for \$1 to \$100. offered each month. The easiest way to write for pay. No previous experience necessary. Send for Free details. No obligation. Saunders M. Cummings. 467-S Independence Bldg., Colorado Springs, Colo.

73 BUSINESS SERVICE

YOUR product represented in Chile—for details write Pedro Bustamante, Avenida Sur 1770, Nunoa, Santiago, Chile.

74 CARTOONING, SIGN PAINTING, DRAWING AIDS

"HOW to make money with simple cartoons". A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 193-C, Pleasant Hill, Ohio.

BE a showcard writer. Learn at home in three weeks. Uncrowded. Big money field. Make sales very first week. Write R. J. Meisner, 1539 Wisconsin Ave., Dept. 13, Flint 6, Michigan.

SIGN painting taught at home. Test lesson free. Ben Kerns, Box 812-PS, Greenville, S. C.

75 CHALK TALK-STUNTS

CHALK Talks. Laugh Producing Program. \$1.00. Illustrated Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

76 TYPEWRITERS

RECONDITIONED Typewriters. Printing Devices. Office Appliances. Supplies. Dixiegraph, King, N. C.

77 OFFICE SUPPLIES & EQUIPMENT

STANDARD Typewriters \$25.00; Duplicators \$12.50; ship all States. "Typewriters." 118 Spruce, Wichita, Kansas.

78 RUBBER STAMPS

3 LINES, cushioned, indexed, 55c. Pads 35c. Printright, Wauwatosa, Wis.

QUALITY Stamps! 3 Lines, 50c. 250 Letterheads—Envelopes, \$1.98. Catalogue, Johnson Press, Box 6-B, New York City 26.

79 PRINTING OUTFITS, SUPPLIES

PRINT-O-MATIC mimeographing Post Card Typeless Stencil Duplicator Printer \$13.50. Office Duplicators—Hilcos, Speedoprints, Typewriters, Portable Adding Machines, Addressettes, Automatic Envelope Sealers. All office machines. Duplicator Supplies. Literature Free. Pittsburgh Typewriter Supply, 336-6 Fourth Avenue, Pittsburgh 22, Pa.

PRINTING Presses, Type Supplies. Lists 3c. Turnbaugh Service, Loysville, Penna.

PRINTING Presses, type, supplies. Send stamp for details or dime for complete illustrated printer's supply book and samples. Kelsey Corp., J-8, Meriden, Conn.

WEDDING Announcements! Lovely! Free Samples. Printshop, 176 Fourth, Leominster, Mass.

MAKE Your Own Plastic printing cuts. New Plexiplate Process. Plexiservice, Argyle 2, Wis.

GOLD Imprinter \$3.25. Samples 10c. LaGarza, 8 Walden, Cambridge 40, Mass.

80 PRINTING, MULTIGRAPHING, ETC.

1000 BUSINESS Cards \$2.50 prepaid. Samples free. Reliable Print Shop, 905 East Jefferson, Louisville 6, Ky.

PHOTO Offset, 1,000 8½ x 11, \$7.50. Send Dime for Pricelist (Refundable). Mimeographing; Printing. Direct Mail Campaigns. Mimic Reproductions, 383P No. Corona, Valley Stream 2, N. Y.

50-8½x11 HAMMERMILL Letterheads with 50 Envelopes—\$1.00 Postpaid. Benneville, 1204 Merryfield, Pittsburgh 4, Pa.

GUMMED Labels. Stationery. List free. Reed, Box PS-135, Spiro, Okla.

400 8½ x 5½ LETTER-heads \$1.35. Mango, 555-B South 20th, Newark 3, N. J.

BUSINESS. Personal stationery. State requirements. Samples. Mero Products, 99 Morrison, Punxsutawney, Pennsylvania.

1000 NAME and address labels \$1.00. Personalize books, letters, records, etc. Davis—Box 172, Keene, New Hampshire.

SEND 10c Now, for our 48 page price-list—Refunded first order. McCall Press (PSM), 1326 South 27th, Omaha 5, Nebr.

82 PATENT ATTORNEYS

INVENTORS. For "Record of Invention" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building, New York 7.

PATENT practice before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 413, 815-15th St. N.W., Washington 5, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John N. Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

INVENTOR'S Guide free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7.

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 938 Columbian Bldg., Washington 1, D. C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 92B-A District National Building, Washington, D. C.

PATENTS—Trade marks. Irving L. McCathran, 316 McLachlen Bldg., Washington 1, D. C. Registered Patent Attorney.

INVENTORS—Patent Laws encourage the development of inventions. The Rules of Practice of the U. S. Patent Office advises—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No Obligation. McMorow, Berman & Davidson, Registered Patent Attorneys, 143-Y Victor Bldg., Washington 1, D. C.

INVENTORS—If you consider your invention to be something of importance, you may take steps to protect it with a U. S. Patent which gives you the right to exclude others from making, using and selling your invention as claimed. "Patent Protection for Inventors" booklet outlining steps to take to secure patent protection will be mailed promptly without obligation. Victor J. Evans & Co., Merlin M. Evans, Registered Patent Attorney, 441-C Merlin Building, Washington 6, D. C.

PATENTS, Trademarks, Salubridad Registrations in Mexico and Latin America. Free Particulars Immediately. International Patent Bureau, Mexico, Apartado 10727.

83 FOR INVENTORS

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 92A-A District National Building, Washington, D. C.

PATENT Searches \$5.00; Also electronic and Engineering searches. Immediate attention. Request free protection form. Patent Service, 703 Albee Bldg., Washington 5, D. C.

"INVENTOR'S Guide" free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

INVENTORS: If you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 36A, 1926 Eye St. N.W., Washington 6, D. C.

INVENTORS: The usual First Step is to have a search of the U.S. Patents conducted, so I can report on Patentability. Write, without obligation, Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 939 Columbian Bldg., Washington (1), D. C.

EXPERIMENTORS. Inventors Save Time Money. Unusual Service. Free Information. Ebert, 110 Harris, LaGrange, Illinois.

IDEAS are worth money. Free booklet. Elo Development Company, L. I. City 1.

INVENTORS. For "Record of Invention" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS—Patent Laws encourage the development of inventions. The Rules of Practice of the U. S. Patent Office advises—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorow, Berman & Davidson, Registered Patent Attorneys, 143-X Victor Bldg., Washington 1, D. C.

YOU can sell your idea without a patent! By a tested and proven method! Ideas are needed by manufacturers. Make use of that stored up idea. Do as the professional inventors do. Eliminate expensive, time consuming red tape! Written by a man who has been successful in this field. Effective! Simple! Do something about it. Complete information \$1.00. Start Now! W. H. Jones, 17763 Beach Drive, N.E., Seattle 55, Washington.

PATENT Protection—Unless an inventor is thoroughly familiar with such matters, he is advised to employ a competent registered Patent Attorney as the value of a patent depends largely upon the skillful preparation of the specifications and claims. Send for booklet, "Patent Protection for Inventors," outlining preliminary steps to take to obtain patent protection. Victor J. Evans & Co., 442-C Merlin Building, Washington 6, D. C.

INVENTORS: Get Cash for Ideas! Big 32-page bulletin gives hand-picked list 106 firms that buy patented or unpatented inventions. Bulletin also contains list of wanted inventions, tested selling ideas, how to figure price, sample sales letter, other helps. Send \$1.00. Examine 5 days. If dissatisfied, return for immediate refund. Science and Mechanics Magazine, 751 Science Bldg., Chicago 11, Illinois.

DRAWINGS, Blueprints—Send sketch for estimate. Hull, 7829 Euclid, Cleveland 3, Ohio.

PATENT searches \$5.00. Reports airmailed within 4 days. Invention protection forms free. Write Patent Research Engineering, 318 Evans Bldg., Washington 5, D. C.

INVENTORS—Make your patent search and obtain your patent yourself through our Circulating Patent Library and complete Patent Handbook. Disclosure unnecessary. Details free. International Patent Library, 318 Evans Building, Washington 5, D. C.

84 INVENTIONS WANTED

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information, free. Institute of American Inventors, Dept. 30C, 1926 Eye St., N.W., Washington 6, D. C.

INVENTIONS Promoted, Patented or Unpatented. Write Adam Fisher Company, 183-A Enright, St. Louis, Mo.

INVENTIONS Wanted, Patented or Pending only. Inventors Exchange-D, Hartford 1, Conn.

FAST sales. Cheap protection. Details free. McLoughlin, 1101 Meade Avenue, Scranton 8, Pa.

HIGHEST Royalties—Cash. Official U.S.I.R.C. certification. Request free Booklet "C". Universal Marketing Co., 354 South Spring St., Los Angeles 13, Calif.

ESTABLISHED. Reliable Manufacturer Seeks New Games for Home Playing. Must Be Simple, Have Action, in Popular Price Range. Write Us What You Have.—Confidential. Write Care of P. A. Huettnner, 976 Kent Avenue, Brooklyn 5, N. Y.

85 PATENTS

INVENTORS: Test the commercial value of your patented or unpatented inventions, quickly and inexpensively. Write for free information, Institute of American Inventors, Dept. 30-B, 1926 Eye St., N. W., Washington 6, D. C.

86 PATENTS FOR SALE

FOR Sale—Patents Pending for Sale Simple. Drew Roberts, Cross City, Florida.

88 MANUFACTURING

MODELS small lot manufacturing, metals, plastics, etc. Millburn, Burlington, Ky.

PLASTIC Molding. Fabricating Any Item or Quantity. Plastic Products, Box 384-A, Massillon, Ohio.

89 MODELS, MODEL SUPPLIES

MODEL Ship Builders! Are you looking for authentic, precision ship models? Send for richly illustrated fully descriptive catalogue in full color of famous ships of all kinds. Only 25c. Halesite Yacht Service Inc., Dept. C-49, Halesite, Long Island, N. Y.

MOST complete Illustrated Catalog—"O-HO OO" Model Railroad Parts ever published. Send 5c for mailing. Selley, 1377 Gates Ave., Dept. 836, Brooklyn, N. Y.

SHIP and Yacht model fittings; blueprints. Send 25c for illustrated catalog No. 21—Listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Mich.

SHIP Model and yacht supplies, complete large 64 page catalogue. 30c. Wm. Wild, 510 E. 11th St., New York City.

SHIP Models—most complete line in New England. Kits, parts, plans, books. Steam and electric power plants. Illustrated catalog 25c. James Bliss & Co., Inc., 220 State St., Boston, Mass.

RAILROADERS. 50c gets new 1949 Catalog. Reference Manual. State O or HO gauge. Walther, 269 Erie, Milwaukee 2, Wisconsin.

BUILD Historic Ship Models, complete kits 39c to \$9.00. Catalog 10c. Ideal Models, 21 West 18th, New York 11, N. Y.

CATALOG Illustrating Largest Assortment Ship Model Parts Send 5c. Selley Boats, 1373 Gates Ave., PS, Brooklyn, N. Y.

DOWMETAL Magnesium for all model makers. Rod, Bar, Sheet and Scale Structural Shapes. Craftsmith, 15427 Robson, Detroit 27, Michigan.

STEAM engines, boilers, castings. Catalog 25c. Anton Bohaboy, 2297 Price, Rahway, New Jersey.

MODEL Railroad on a Table Top. Have fun building Americas Smallest railroad models... Scale 1/10"=1 ft. Operate electrically on TT gauge (15/32") track. Build from kits or buy ready-to-run. Big variety Streamliners, diesels, steam locos, freight and passenger cars. Complete set, engine, 3 cars, 10 1/2 ft. track only \$29.95. Send 10c for Big New 1949 Catalog. H.P. Products, Dept. PS, Hartford City, Indiana.

90 MOLDS AND MOLDING MATERIALS

RED Seal Rubber Company Develops New Compound! Genuine Natural Latex Base! Fully Guaranteed! Introductory Offer for \$3.00—Complete Mold Making Course plus Quart of Red Seal Latex! Free Literature upon request, 116 Nassau St., New York 7, N. Y.

91 HOME CRAFTSMEN

SPECIAL Offer: 80 full size toy, novelty, and lawn ornament patterns only \$1.00 Postpaid. Lynds, Box 193E, Medway, Mass.

CATALOG: Patterns plywood novelty furniture, lawn ornaments, letters, numerals, plaques, frames, silhouettes, weather-vanes, toys, Decal transfers. Over 100 other items. 200 articles illustrated. 25c. refunded first order. (No stamps please). Wo-Met Shop, Box 167, Ashburn, Georgia.

CIRCULAR Saw sharpener. Complete \$6.95. Free literature. Sure-Sharp, Box 24-e, Santa Ana, Calif.

94 POPULAR SCIENCE

"KLONDIKE" Jewelry findings—bracelets, pins, earrings, chains, rings, stones, clips and other jewelry parts. Easy to assemble. Sample pound \$2.00, five pounds \$7.50. Imported Cut Stones. For rings, jewelry, novelties, etc. All shapes, colors, sizes. Sample 100 stones assorted \$1.50 lot. Thousand lots, \$5.00. Imported beads, all colors, sizes, sample pound \$1.00, five-pound lots, \$4.00. Prepaid only. Merchandise Distributing, Dept. 2, 19 E. 16th Street, New York 3.

LEATHERCRAFT! Complete stocks of leathers, tools, supplies. Immediate shipment. Free catalog. Kit Kraft, Dept. 3203 W. Washington Blvd., Los Angeles 16, Cal.

LAWN chairs, toys, garden figures, novelties, furniture etc., 66 popular plans with full size patterns, \$1.00. Mastercraft 3S, 7041 Olcott, Chicago 31, Illinois.

JEWELRY findings, shellcraft, misc. supplies. Low prices. Catalog 5c refundable. Hobbycraft Supply, 208 N. Wells, Chicago 6.

MAKE your own "Hercules" Belts! Complete kit includes finest calfskin links, tongue and metal buckle. Simple instructions enclosed. Send \$1.00, we ship prepaid. Arokraft, Dept. S, 32 W. Randolph, Chicago 1.

TROPICAL Wood for Sculpturing and Carving. Lignum-Vitae, Buttonwood, Madiera, etc. For Information Write B. Lurie, Box 892, Coral Gables, Florida.

BANDSAW. Jigsaw owners, let your machine bring extra profits, fun. Free details. Nu-Art, 34 Rosemont, Weymouth 91, Massachusetts.

ETCHING Glass recipe \$1.00. Eleven Chemical Garden recipes \$1.00. Nunn, 659 E. Oxnard, Calif.

COPPER and Brass Materials. Complete line for Craftsmen and Workshops. Catalog Free. Groundmaster Company, Boulder, Colorado.

LEATHERCRAFTERS! Belt kits. Projects. Leather, supplies. Free catalog. Arts Leather, 411 Joseph Ave., Rochester 5, N. Y.

MING Tree Kits, assemble \$30.00 Tree for Only \$6.95 prepaid, includes everything, complete instructions. P. O. Box 329, Sparks, Nevada.

HUNDREDS Show-How plans, patterns, instructions large and small workshop projects. Woodworking, metal, plastics, leathercraft, home repairs. Read Popular Homecraft, published bimonthly. Trial subscription \$2 year, 814-S North Tower Court, Chicago.

KNOCKDOWN Cedar Chest, Lumber and Veneers. Free Price List. Giles Co., Brownsboro, Alabama.

SPECIAL 77 Full Sized Patterns, Lawn Ornaments, Toys and Novelties, \$1.00. Modern Woodcraft, Saginaw, Mich.

TURN your workshop into cash. Send postcard for catalog of modern saleable projects. Craftplans, 7241-S Madison, Kansas City 5, Mo.

REUPHOLSTER Your own car or operate upholstery shop. Complete auto upholstery instruction manual \$2.00 Money Order. C.O.D. First Upholstery Service, 3439 Michigan Ave., Chicago, Ill.

93 BUILD IT YOURSELF

STREAMLINED. Built-in kitchen cabinets to fit any kitchen. Complete, easy to understand detailed plans and specifications showing "professional" construction methods. All for \$1.00. Thombert Co., Box 447A, Newton, Iowa.

EASY and cheap to build tilting arbor saw. Free information. Kwik-Eze Mfg. Co., 1141 Pennoyer Avenue, Grand Haven, Michigan.

TINKERING with and Building Things Catalog Handbook 25c. Details Free. Agents Wanted. Edman, 307J, Radio City Station, New York 19.

"CONCRETE Block Homes." 32 page booklet on how to build. \$1.00. Other Home Building booklets, \$1.00. H. C. Lightfoot, Civil Engineer, Richboro, Penna.

BEAUTIFUL Colonial Post Lamps. Assemble them yourself and Save! Deluxe Kits start at \$7.95. Circular free. Lorenzen Industries, Dept. PS-2, Niles, Michigan.

MAKE your own handy lightweight Concrete Blocks quickly with new Blockmaker. Circular stamp. Manual 25c. Peerless, New Lenox 1, Illinois.

BUILD at home. Inexpensive, practical Concrete block machine. Motor or hand. Write, Clyde Lee, Mountain View 1, Okla.

94 WATCH REPAIRING

WATCHMAKERS' Tools, Supplies Sold—Bought. Catalogue! Bengale Company, Culver City, California.

WATCHMAKERS' Journal Contains helpful hints on watch repairing. Sample copy 15c. Dean Co., 116-B Nassau St., New York 7, N. Y.

WATCH and Clockmakers Handbook—Britten \$5.79. Most complete on subject. Free Catalog. Engineers' Book Service, 19 W. 44th Street, New York City 18.

WATCHMAKERS! Beginners! Watches. Movements, Price List, Box 1874 Chicago, Illinois.

95 OLD GOLD, WATCHES, ETC.

HIGHEST Cash for old, broken jewelry. Mail Gold Teeth, Watches, Rings, Silverware, Diamonds, Spectacles. Satisfaction Guaranteed. Free Information. Rose Smelting Co., 29-Y East Madison, Chicago.

GOLD \$35.00 Ounce—Mail old gold teeth, jewelry, watches, diamonds—receive cash by return mail. Satisfaction guaranteed. Free information. Dr. Weisberg's Gold Refining Company, 1500-B Hennepin, Minneapolis, Minn.

96 JEWELRY

JEWELERS supplies, findings. Latest catalog, 10c. George Sassen, 154 Nassau Street, New York 7.

MAKE Your Own Jewelry! All types of findings, plastic and metal; cameos, beads, shellkits, illustr. catalog, 20c. Hobby Art, Dept. 6, POB 276, New York 18, N. Y.

97 TOBACCO & PIPES

SECONDS \$5.00 pipes 65c. Briar blocks, bits, carnauba wax, silver bands. Free literature. Carvapipe, 2829-F Dixie, Hamilton, Ohio.

100 MISCELLANEOUS

BOOKFINDERS! (Scarce, out-of-print, unusual books) Quickly supplied. Send wants. Clifton, Box 1377-PSM, Beverly Hills, Calif.

RAISE ginseng. Roots bring \$10.00 pound. Circular free. Fezler Seed Co., Patchogue, New York.

FIREWORKS: Don't be disappointed. Get Famous Banner Fireworks with all the newest and startling effects. Giant cannon salutes that rock you like a crash of thunder. Whistling devils with weird unearthly noises. Skyrockets that burst in majestic colorful display. Gasp in amazement as you watch the battle in the clouds. Genuine Chinese firecrackers. Over 500 pieces including sparklers for the little tots. Retail value \$12.25 for only \$4.95. Rush order today. Any quantity. Send money order, bank draft or currency. No c.o.d.'s. Big new catalog free. Banner Fireworks Mfg. Co., Inc., Dept. 114, 440 Capistrano, Toledo 12, Ohio.

LUMINOUS Powdered Pigments Trial Offer and listing \$1.00 Prepaid. Glowelco, 475-SP Fifth Ave., New York 17.

MOLD Makers! X.L. Rubber is back. Pints \$2.00. Quarts \$3.50. Gallons \$8.95. Models. Free catalogue. Plastic Arts, Dept. 10, Route 2, Muncie, Indiana.

"INTERESTING Mails." 25c will keep your mail box full for three months. Bentz, Jr., Chatawa 17, Mississippi.

"THIS Is It!"—Learn Sew machine Repairing, plus profitable installing our motor kits, etc. Write Taylor Service Co., Hamilton 5B, Ohio.

BIG Profits Operating automatic shoe shine machines. Vassar, Cleveland 5, Ohio.

SURPLUS 5 Gallon Drum Red Oxide Paint \$8.95. Not Much Left. Hurry! Send Money Order. Flecks, Warren, Ohio.

CARTOONIST sketched envelopes, samples 10c. Larsen, Box 961PS, Minneapolis, Minnesota.

PICTURE Puzzle Fans—Win big prizes. Learn the tricks of the picture puzzle creators. Now you can solve those Tie Breakers and win big cash prizes. For your key to a fortune—send \$5.00 today for "Secrets of the Picture Puzzle." Box 1541, Philadelphia 5, Pennsylvania.

NEW type insect Destroyer. Electrical. Really amazing. Investigate! Willie Allen Moore, Grambling, Louisiana.

WE wish to hear from anyone who believes in "Lost Atlantis, etc." A "fascinatingly fantastic Discovery"—Lemurian Time Capsule. Atlantian Research, Brady Lake, Ohio.

GOOD jobs and a Sound Substantial Future await you in hotel and institutional field. Men and women—all ages—needed for well-paid positions that offer color, excitement, ever new and fascinating duties. Record breaking travel means even greater opportunities for trained men and women in hotels, clubs and institutions. Lewis School receiving calls for managers, assistant managers, stewards, hostesses, purchasing agents and 55 other types of important positions! From coast to coast there are important positions that offer splendid opportunities for advancement in a business where you are not dropped because you are over 40. Previous experience proved unnecessary! No need to leave your job to qualify. A good grade school education, plus Lewis Training qualifies you at home. In spare time. Our National Placement Bureau helps to place you—and our amazing Certified Job Plan—actually certifies you will "make good" when placed. Write today for Free book! Veterans: Course approved for Veterans' Training. Lewis Hotel Training School. Room PC2768. Washington 7, D. C. (First and only School of its kind—now in its 33rd year.)

WE purchase Indianhead pennies. Complete alicoin catalogue 10c. Fairview, 277 Broadway, New York 7.

RECEIVE mails, magazines, samples. Your name in numerous mailing lists 10c. Greenwood, 273 Broadway, New York 7.

PORCELAIN miniatures made from your favorite photo. Prices available. Studio 3, Box 91, Ansonia Station, N. Y. 23.

MEN'S, Boys' Leather Belts. Exceptional value 65c. Caspy, 239 Dumont Ave., Brooklyn 12, N. Y.

BIG Mails Three Months. Name Listed Directory 25c. Harvey Teeple, Decatur, Indiana.

WORLD Globes—electric models—free catalog. Belanger's, 51 G Talcott Ave., Rockville, Conn.

URANIUM Prospector's Handbook \$1.00. Craft-Connor Pub. Co., 601 S. Vermont, Los Angeles 5, Calif.

OUT of print books found quickly. Send wants, no obligation, free catalog. Coast Bookfinders, Box 8636, Los Angeles 46, California.

INVISIBLE Inks. Nineteen recipes \$1.00. Nunn, 659 E. Oxnard, Calif.

TREASURE Locators. Mineral Detectors. Geiger Counters for Uranium ores. Free literature. Fisher Research Laboratory, Inc., Palo Alto, California.

PANNING Gold—Free instructions. Catalogue mining books—supplies. Old Prospector, B-221, Dutch Flat, Calif.

GROW all potatoes you want on 8'x12' plot scientific method. Send \$1.00 for complete instructions. Gardner, 1121 Woodland, Austin, Texas.

SEE "Karl-Keep" advertisement under "Business Opportunities"—fascinating new money-maker!

DON'T throw old ball-point cartridges away! Mail them to me for refilling. Enclose 20c with each. Bird, 2413 Madison, Wilmington, Delaware.

QUILT pieces, 3 pounds \$1.50. C.O.D. Cylester Bibbs, P. O. Box 5157, Indianapolis, Indiana.

101 FOR SALE—MISCELLANEOUS

WAR Surplus. Aircraft items. Shop Equipment. Machinery and a million other items. Free Catalog. Atlas Equipment, 229 Southwest Blvd., PS., Kansas City 8, Mo.

ARMY 2 Way combat phones. Sound Powered. No batteries needed! New! 2 sets \$2.50. Akron Army-Navy, 4379 Sunset, Los Angeles 27, Calif.

BRUSHES. Small Paint. Varnish. Lacquer, etc. War Surplus. 25 for \$2.00. Postpaid. Elgene Company, 9015 5th Ave., Brooklyn 9, N. Y.

WASHING Machine. Vacuum Cleaner Parts. Andy's, 4325 N. Ottawa, Chicago 34, Ill.

FOR Sale Leatherette Remnants. Many Sizes. Colors. Get acquainted 20 pounds \$6.00. Leatherette Shopping Bags 89c. 200 Shells assorted \$6.00. Orville Wischart, Shirley, Indiana.

\$10,000 OFFERED by U. S. Government for each usable uranium find. Write for free information on Goldak's new ultra sensitive Geiger counter for prospectors of radioactive ores. The Goldak Company, Dept. S, 1544 W. Glenoaks Blvd., Glendale 1, Calif.

102 WANTED MISCELLANEOUS

MERCURY—Highest prices. Free Containers. Write Mercury Terminal, Norwood, Mass.

CASH for Cameras, Microscopes, Binoculars, Tools, Scientific Instruments, Gordon, 187 Madison, Chicago.

I HAVE Cash Buyers for anything. Free particulars. Toole, Box 415, Evansville, Indiana.

103 FOR THE HOME

SWISS Music Box Movements Suitable for Many Novelties from \$1.00 to \$3.50. Send for Circular and Literature. Bell Music Box Co., 280 W. 86th St., New York 24, N. Y.

104 PERSONAL

How You can find out! Information discreetly developed. Any matter, person, problem, anywhere. Personal-Business assignments, representations undertaken. Nationwide. Officially licensed, bonded service. Established 1922. Reasonable. Confidential. William Herman, 176 Broadway, New York.

BIG Mail—Everlast Ball Pen, 25c. Capener, 849 Almaden, San Jose, Calif.

HAIR Falling? Dandruff? Write Trichologist, 139 Lewis Street, Phillipsburg, N. J.

BORROW by mail. Loans \$50.00 to \$300.00 to employed men and women. Easy, quick. Completely private, confidential. No endorsers. Repay in convenient monthly payments. Details free in plain envelope. Write State Finance Co., 216 Savings & Loan Bldg., Dept. R-14K, Des Moines 8, Iowa.

NEW Sulphur Suds Relieves Aches, Pains, 8 Baths. Instructions \$1.00 Prepaid. Moss Soap Co., 914 So. Seventh, St. Louis, Mo.

FAMOUS Brooklyn Postmark! Letters Remailed 25c. M. Victor, 93 Hart St., Brooklyn 6, N. Y.

RUPTURED? Positive comfort, no understraps, no steel, no elastic. Write Smith Manufacturing Co., Preston, Ontario.

PSORIASIS Sufferers: Has everything failed to bring even temporary relief from scales, lesions and itching? Then write today for Free important information. You needn't invest one cent! Pixacol Company, Dept. S, Box 3583, Cleveland, Ohio.

WAR surplus Clothing. Men's, Women's. Amazing bargains! Free catalogue, N.Y. Clothing Co., 2079B Second Avenue N.Y. 29.

SLEEPLESS? Try Sleep-rite Earstoppers. Set free. Raymond Dow, 2922—164th, Flushing 20, N. Y.

REAL, positive help for victims of baldness. Scalp Make-Up* instructions \$2.50. L. Perlmutter, Box 7719, Benjamin Franklin Station, Washington 4, D. C. *Copy-righted.

STUTTERING Corrected At Home. Lesson Technique successful with adults and children for many years. Send for free literature. The Athenaeum, PS-3, 1714 Chestnut, St. Louis 3, Mo.

WONDERFULLY fuller life, success, happiness, freedom from fear, worry are your natural rights. Inspiring, free 16-page book, "Mountains of Gold", tells how you can start now using your dormant personal power for amazingly satisfying, richer living. Write for your copy. Institute of Naturlaw, Dept. P24S39, 2208 Main, Dallas, Texas.

SLEEP Without Drugs. Write for free information. The Slumber-Tone, 12314 East Outer Drive, Detroit 24, Mich.

MEXICAN Law. General Practice Attorney, 1203 Arizona Street, El Paso, Texas.

FORGET Sinusitis, colds. Safe, sane new way quickly helps relieve. Medically recommended. Write today Free information. Pinolator, Inc., 1809 M'haha Ave., Minneapolis 4, Minn.

HAIR thin, falling, dandruff? Getting Bald? Amazing results! No liquids, greases, gadgets. Write Life System, 325-P.S. N. Western, Los Angeles 4, Calif.

DANDRUFF? Dry Hair? Itchy Scalp? Postcard brings 16-page booklet; prompt relief, better hair, Regime Products, 9A S. Clinton, Chicago 6.

CREATIVE Psychology can help solve your problems. The technique that gets results. Details free. Beacom, Box 177-C, New Brighton, Penna.

106 ADVERTISING

AVOID costly advertising mistakes. Get enlightening Ad-Guide and Ratebook leading newspapers, magazines, mailing lists, 10c. Chicago Advertising Agency (Established 1900), Chicago 4.

24 WORDS in 50 Weeklies, \$4.96. J. Darnell, 730 Hays, Jackson, Tennessee.

EXPERIENCE pays: Highly resultful "know-how" methods. Direct mail, mail-order, campaigns. What's your problem? Finkle, 257 South Spring, Los Angeles 12.

ADVERTISE: 24 words, 40 Newspapers, \$3.50. Lists Free. Advertising Bureau, 10511-P Springfield, Chicago 43.

115 DRAWING & ART SUPPLIES

DRAFTING and artists' materials catalog—thousands of items—25c (deductible first \$2 order). Gordon's, 187 Madison, Chicago.

117 TATTOOING SUPPLIES

TATTOOING Outfits, Supplies, Illustrated List Free. Zeiss, 728 Lesley, Rockford, Illinois.

120 CANDY MAKING

MEN-Women — "Most Everybody Likes Candy." Learn to make in a professional manner at home. (Our 39th year.) Ragsdale Candies, East Orange, N. J.

121 FRUITS AND FOODS

VERMONT Maple Syrup—Gallon \$6.00; half-gallon \$3.50; f.o.b. Forest Farms, Jamaica, Vermont.

ORANGES, Red Grapefruit, Tree-Ripened, My Orchard, McCanta, Weslaco, Texas.

126 CAMPING

WAR surplus tents all sizes, paints, camping equipment, cots, canvas covers. Morsan, 10-19D 50th Ave., Long Island City 1, New York.

129 MAGNETS

TWO Alnico (V) Rods. Booklet, Circulars—25c. Terry Sales Company, Box 1014, Toledo 1, Ohio.

131 TREASURE FINDERS

METAL Detectors. The Very Latest Circuit. Free Literature. Hedden Metal Detectors, 3329 Liberty St., Pittsburgh 1, Pa.

SEEK Buried treasure! Methods, mysteries, devices explained. Circulars free. Century Press, Box 151-D, Glen Ellyn, Ill.

TREASURE-Mineral Locators, M-Scope, Low Priced, lightweight, unsurpassed in efficiency. Revolutionizes locating of minerals and precious metals. Geiger Counters for Uranium ores. Time payment plan. Factory guaranteed. Free 16-page booklet upon request. Fisher Research Laboratory, Inc., Palo Alto, California.

TREASURE Hunters! New 11-pound feather-weight Model 101 locates gold, silver and minerals. Money-back guaranteed best available. Free information. The Goldak Co., 1544 W. Glenoaks, Glendale 1, Calif.

137 DETECTIVES

DETECTIVES—Work home—Travel. Experience unnecessary. Write Wagoner P-125 West 86th, N. Y., N. Y.

DETECTIVE Training. Phillips Secret Service, 1917C North Kenneth, Chicago 39, Illinois.

142 INFORMATION

SOURCES of supply, \$1.00 per source. Send No Money. Pay on approval. Donald Kelly, AL-9344 Whitcomb, Detroit 27, Mich.

PROMISE: "Will not injure anyone, exercising cosmic consciousness power"; becoming my student, receiving immediately \$2.50 book on month's approval for free study; learning scientific instantaneous healing, "success" demonstration and telepathy. Failing ineffable satisfaction within month return book. Otherwise remit: Crane, Author, Kingsport 4, Tenn.

RESEARCH Library Congress. Any Problem \$1.00. Literature free. F. A. Harris, 4496 Brookland Sta., Washington, D. C.

143 NAME LISTS

MAILING lists; most classes, 1000 \$5.00. Free Prospectus. Dixie Service, King, N. C.

145 SOUVENIRS

THREE Military Emblems, price list 10c. Hobbyguild, 57-X Sumner Ave., Brooklyn, N. Y.

A DOUBLE PAGE OF PALLEY VALUES!!!

HERE THEY ARE! THOSE TERRIFIC MIX VALUES

GADGET MIX
Especially prepared for the HOBBYIST. Rivets, Spacers, Bolts, Screws, Nuts, Gears, etc. A gold mine. #106, 5 LBS. **\$1.19**

BEARING MIX
Needles, Ball & Roller Bearings in excellent assortment. Sizes from 1/8" to 2". One of our "BEST SELLERS". 15 BEARINGS #170 for ONLY **\$2.95**

HINGE MIX
12 pairs of strap and butt Hinges. Sizes 1" x 1" to 1 1/4" x 4" in length to 8" strap. #170H. A \$3.00 Value FOR ONLY **\$1.09**

ABRASIVE AND GRINDING WHEEL MIX
50 Pieces including honing stones, pencil rolls, wheels, abrasive sheets, etc. A really sharp value. #170AG. **99c**

SPRING MIX
Tension, Compression & Torsion Springs, steel, brass. A treasure trove for emergencies. #205 **89c**

COMBO-MIX
Comb. of all above, all in one pkg. deal. At special introductory price **\$5.79**

FILE MIX
Ten Assorted Files of 6", 8", 10", 12", includes 3 Vixens, half rounds, bastards, mills, etc. in seconds and used but in good condition. 1 Vixen alone worth our price for the entire mix **99c**

LENS MIX
THE PHOTOGRAPHERS FRIEND
10 pieces of precision finished lenses, and first surface mirrors, including the following:
A 51 mm dia. double lens. A 35 mm dia. lens with speed fig. a complete set of 3 lenses, one double concave, two objective plano-convex, each having a 12" focal length, one 3 1/4" dia. plano-convex lens with a 9" focal length.
Also 3 double sided first surface mirrors totaling 37 square inches, worth \$10.00.
Make your own projector, portrait and enlarging lens magnifiers, photo spots, etc.
You'll brag to your friends about this one for ONLY **\$5.49**

PULLEY MIX
You'll want this one a-round. 10 microns and metal pulleys ranging from 1" to 5" with ball and one piece bearings. These are aircraft pulleys, the best made with hundreds of uses.
A WONDERFUL BUY @ **\$2.95**

SWITCH MIX
New 12 assorted types of Aircraft Switches. Including double & single throws, double & single poles & multiples. Voltage ratings from 5 to 20 amps. 125 Volts A. C., 35 amps. 24 Volts D. C.
A 1001 uses in Auto, Truck, Tractor, Jeep, Shop, Radio, etc. **\$2.95**

REAMER MIX
168—Reamer Assortment: Special Taper line finish Reamers - High Speed Steel. Slightly used but in excellent condition. Ten assorted sizes ranging from .186 x .165 and .244 x .215 to .425 x .385 and .432 x .403. One alone worth our selling price of ten.
For set of ten Reamers **\$4.49**

COUNTERSINK MIX
#168A - Countersink Assortment: Excellent condition - High Speed Steel. Assortment of ten 100" and 110" with pilot sizes ranging from 3/32" to 3/16". For Ten **\$2.69**

DOUBLE CASTER UNIT
2 Needle bearinged 6" Casters joined as a unit on a 7 1/2" x 8" rubber protected steel face plate. The unit is 9" high and will completely swivel. Ball bearings in swivel entirely enclosed and protected. Bolts furnished. If you have to move heavy machinery or rigs these are just the unit.
At a Fraction of its cost. Unit **\$9.85**

AIRCRAFT INSTRUMENT MIX - 12 different new or good used cond.
Fuel Air Ratio Right and Left Indicator Oil Pressure Gauge
Air Speed Indicator Flap Position Indicator Liquidometer
Manifold Pressure Indicator A-8 or A-9 Oxyg. Reglats. Engine Gauge Unit (Fuel & Oil Pressure cyl. hd. temp.)
Autoson Ind. & Transmitter Landing Instruction

These Instruments contain sensitive meter movements, Miniature gyro, jewels and ball bearings, gears, valves... a treasure trove of fine parts.
APPROXIMATELY \$2000 GOVERNMENT COST FOR ONLY **\$16.95**

CHEMISTRY SET
Made for Chemical Warfare Division for testing water, etc. Complete set with chemicals, test tubes, full instructions.
Packed in attractive lucite box, with covers and dividers. **\$1.39**

REEL COUNTER AND CONTROL BOX
Counts 0 to 999, each drive advances figures one numeral. Manual single pole, double throw switch has neutral position and serves to reel forward and reverse, with red jewel instrument light to indicate winding operation. Reset dial to turn counter back to 0. Assembled in compact 2"x2 1/4"x5 1/4" box. **\$2.69 Each**

Loading Switch MC
Containing many electronic parts including 5 position multiple switch, 4 micro adjustment rheostats, fixed resistors, etc. A profitable investment @ **69c**

Boat Fender
21" long 5" dia. Protection against docks for small boats. \$6.50 Value A Sweet at **\$1.95**

EX-1 - HYDRAULIC MASTER & SLAVE UNIT
Extractor Controls. Eliminate complicated rod linkage for throttle control on boats, gasoline engines, etc. These two units connected with 1/4" tubing and filled with oil serves as a precision 1 - 1 ratio 90° throw control with a minimum of effort.
Combination Master and Slave **\$15.95**

AIE CO OXYGEN REGULATOR
Latest design, sturdy, lightweight - dual gauge regulator unit. Gauge range from 0-220 P. S. I. regulated pressure 0-3000 P. S. I. bottle pressure.
Designed for safety factor of 2400 P. S. I. Fits all standard Oxygen high pressure bottles, used in welding, torch cutting, Oxygen breathing.
Compare this value anywhere **\$12.50**

#155 VICTOR CUTTING TORCH **\$15.75**
Type #400SS. Used but in gd. cond.

PLUMB SNAP-ON SOCKET SET
6 Sockets, 1/4, 5/16, 11/32, 3/8, 7/16, 1/2.
With Ratchet, Flex Handle, Tee Handle. Chrome, Natural Finish Sockets. Rockwell Hardened. Steel Case **\$4.49**

BC 306-A NEW SIGNAL CORPS TUNING UNIT
In heavy alum. case with black chrome finish 18"x10"x8". Valvet vernier dial knob, calibration 0-100, with locking assembly. Switch - 5 position with knob. 4 1/4" diam. coil with three ohms inside, and movable induction tuning coil. WORTH MANY TIMES MORE **\$1.89 ea.**

HS 23 NEW LOW IMPEDENCE RADIO HEADSET
The latest and most improved style, currently in use in aircraft. New. Packed in original boxes. Leather head band, sponge rubber ear pads. Includes CORD and JACK **\$3.25**

HEADSET HS-30-U
Two Magnetic Type receivers in watertight brass case. Soft rubber inserts in each receiver to fit into wearers' ears. Flexible steel head band, ideal for communications, divers, workers in noisy compartments, etc. NEW! **\$1.59**

VINYLLITE TUBING
Capable of insulating up to 5000 volts. This Plastic tubing used for protecting wire, decorative purposes, water or other fluid hose. Price per ft.
1", Black, Clear, Red **.15**
1/2", Clear, Red **.12**
3/16", Grey, White **.12**
3/16", White **.02**
3/16", Clear **.02**
No Sale Under \$1.00
Above sizes are only a sample of the stock we carry, should you desire other sizes or types please send us your inquiry.

PNEUMATIC AND AIR TOOLS
10,000 in various popular makes, sizes, types, Cleco, Aro, Ingersoll Rand, Chicago, Pneumatic, Buckeye, etc.

RIVET GUNS
Pistol & Goose-neck Type. 101 Uses. Chipping, Riveting, Hammering, Breaking cement and auto body work.
Chicago Pneumatic, Cleco, Ingersoll Rand Makes.
E3, E2, 3X, 2X, OY
\$55 Value
\$8.95
\$80 Value
\$15.95

#186 PNEUMATIC ALLIGATOR SQUEEZER

AIR DRILLS OR MOTOR SPECIAL
with 1/4" JCB Chuck
THOR #210R Model 4526
REVERSIBLE AIR DRILL
000 R.P.M. Xlnt. for Tapping **\$19.95**

PNEUMATIC ANGLE DRILL
With Terry Adapter ea.
Send for Catalogue and List of Other Sizes, Types of Pneumatic Tools.

Here's a Real "Lite Special"
Farm, Auto, New U. S. Navy Portable Pistol Grip, Sealed Beam, 12v. Search Spot, or Emergency. Light - featherweight Gov. Cost \$35.00 our price **\$1.95**
3 Extra fillers - Red, Green & Amber 93c Set

NEW FLEXIBLE GOOSENECK LAMP
110 V. A. C., 13 ft. wire with socket, switch and plug. In mounting bracket suitable for home or workshop. Wire alone worth our price of **99c each.**

NAVY BATTLE LANTERN
ATTN. SPORTSMEN, OUTDOOR WORKERS! THIS IS A MUST FOR YOU!
This powerful battle tested lantern complete with 2 standard 1 1/2 volt dry cell batteries. One of the finest hand portable signaling and lighting units known a terrific beam. Size 6" x 7" x 4" with a 4" dia. reflector. Comp. Only **\$3.29**

PIANO HINGE
Overall Width Length Price
1 1/4" (3/4" side) 72" alum. \$1.00 ea.
2" (1" side) 72" alum. \$1.19 ea.
1 1/2" (3/4" side) 53" cad. steel .75 ea.
3 1/2" (1 1/4" side) 33" steel \$1.00 ea.

AIRCRAFT CABLE
Alloyed steel, rust resistant, 3 16" dia. 18 ft. long, with turnbuckle ends. **99c**
On reels in any length
1/16" 3c ft. 3/16" 6c ft.
3/32" 4c ft. 1/4" 8c ft.
1/8" 4 1/2c ft. 9/32" 9c ft.
5/32" 5c ft. 1/2" 12c ft.

RUBBER GOODS
NEOPRENE SHEET RUBBER
Thickness approx. Width (inches) Price per yd.
#325 .020" 1/64 36" .75
#328 .032 1/32 22" \$1.39
#329 .125" 1/8" 46" \$4.75
Item #329 is laminated rubber sheet with cloth center. Flexible but very firm for heavy wear. Rubberized Hosp. or Bed Shts. 54"x72". \$10.00 Value Only **\$2.29**

ELECTRIC SOLDERING IRON
#198 110 Volt A. C. Vulcan **\$8.50 Value**
#198 200 Watt **\$3.95**
#198A 100 Watt **\$2.95**

PALLEY SUPPLY CO. THE LARGEST FIRM ITS TYPE OF IN THE WORLD DEPT. P.S.3 6321 SAN FERNANDO RD. GLENDALE 1, CALIF.

SAVE up to 85% in WAR SURPLUS at "GADGETEER'S HEAVEN"

New Hydraulic Cylinders, Valves, Pumps, Fittings, Hose and Tanks

51 SIZES AND TYPES. WORLD'S LARGEST SUPPLY 1001 Labor Saving Adaptations for Pulling, Pushing, Lifting Operations. Finest Precision workmanship and materials. Liquid and Air Operation. developing terrific power. 20,000 Available. Write for Catalogue. Priced to sell at 15% Gvt. Cost

PUMPS, New Hydraulic, Vacuum, Air P-1 HYDRAULIC PESCO TYPE

Positive displacement gear-type. Capacity: 1 gal. per minute, at 1500 R. P. M. at 1500 P. S. I. Operating speed: 3700 R. P. M. intermittent maximum 4500 R. P. M. Rotation: either direction with slight adjustments. \$9.49

800 GPH at 30 PSI. can also be used as hydraulic for 4 GPM at 400 PSI. or for Vacuum drawing 15 in. mer. at \$6.29 ea. 1500 R. P. M.

VALUABLE GEARS BARGAINS!

#112 8 to 1 ratio, spindle drive \$2.98
#110 6 to 1 with screw shaft \$4.98
#111 85 to 1 (can be used for radio, antenna, etc.) \$3.95
#112 10-1 gear ratio \$3.95

DC GENERATOR 140 AMP

Direct Current Generator, especially suited for adaptation to homemade welding unit.

A fast moving item at \$17.95

P-1 GENERATOR 200 AMP \$22.50 ea.

T-1 GENERATOR 12 V., 25 Amps at 1800 to 4200 R.P.M. Trucks Aircraft. Radio. A Real Value \$13.95

D. C. METERS

0 - 30 AMMETERS \$3.95
0 - 120 \$4.95
0 - 240 \$4.95
0 - 300 \$4.95
0 - 600 \$4.95

Comb. Voltmeter-Ammeter \$4.95

30V - 30 Amp.
30V - 60 Amp.
30V - 120 Amp.
30V - 240 Amp.
30, 60, 120, 240 or 300 Amps.

SHUNTS required with use of DC Meters \$1.00 ea.

WINCH HOISTS

Thousands of satisfied users. Hundreds have written, the most wonderful tool in the world.

No. 100 WINCH HOIST

Cap. 2500 lbs. with 24-1 ratio controlled bronze worm gear. 19" 1/4" alloyed steel cable with hook, two speed handle. Ideal for Garage, Truck Idlg. Mach. Shops, Boat Bldg., etc. A \$100 Val. \$15.99

TINY MITE WINCH HOIST

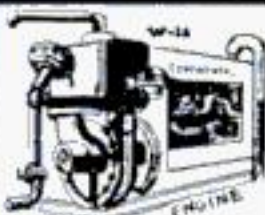
1000 lb. Capacity, with 30 to 1 Bronze worm gear. 4"x1 1/4" Cable drum. Ratchet on hdl. safety factor to hold load, with pin release lowering loads, tightening lances, etc. \$7.49 ea.

Giraffe Neck Winch Hoist

31 in. overall length. 40 in. Tube ext. with 2 in. pulley. Ratchet brake on extension. Brake holds load in any position and is Automatic. Perfect for height, swing about, Truck, or platform loading. 12 H. 3/16" cable with eye hook. Will take 2000 lbs. \$15.99

PLASTIC PARALLEL STRAIGHT EDGE

with knobs and rubber pads for non slippage on each section. A must for navigators, mechanics, draftsmen, and engineers. You've never seen 'em at 97¢ ea.



WATER PUMP WIP-1 100 Gallons per Minute. 75 ft. head pressure, with 2" standard pipe parts. \$159.00

PUMP SOLD SEPARATELY OR PUMP AND GAS ENGINE SOLD TOGETHER AS ONE UNIT \$325.00

Genuine Red Seal 4 Cycle Air Cooled L head H.P. CONTINENTAL GAS ENGINE

standard equipment inc. Mesh type air cleaner, flywheel, magneto, float type carburetor, blower housing, muffler, fuel tank, fuel filter with shut off valve, starter pulley, etc. The ideal power package for light tractors, lighting plants, compressors, boats, lawn mowers, etc. And cost your eyes at this price \$47.95

Used but Guaranteed Condition... \$32.75

A \$75.00 VALUE NEW For ONLY \$47.95

New BRIGGS & STRATTON MODEL "A" GAS ENGINE

Rating 2.10 H. P. 4 cycle, single cylinder. Complete in original Factory Crates. A \$102 Value for Only \$64.95

W-18 LARGE HEAVY STEEL FILTERING TANK

30" dia. x 4' high. Complete with 2 large line filters, line pressure. Gauges, 5-way diverter valve (washing, filtering, filtering to waste, shut, by pass). Chlorination control panel with gauges, pressure regulating valve and tanks. 2" standard pipe plumbing throughout. \$229.00

Sperry Aircraft Directional GYRO COMPASS

Precision made for sensitive direction 360° swing calibrated in 1/10 degree (6 min) Luminous dial. Built in 3 volt instrument light and bank indicator 4 1/2" cube metal box with 3" dia. face. Operates on Vacuum, ideal for cars, light planes or boats. Can be used in autos and boats by attaching one tube to intake manifold. Complete with caging and reset knob. Re-issue. Good Condition ONLY \$4.49

High Pressure Oxygen Bottle

New. Will hold up to 3,000 lbs. PSI. with Co2 used as tire inflator or fire extinguisher, with oxygen for sick room or deep-water diving, etc. Completely equipped with brass valve, 3/8" hose, Dial gauge, & canvas bag. \$2.29

Stewart-Warner Heater, New

Compact Car-like Gasoline fired heater with motor, fan blower. Automatic. Thermo Switch. Copper element, glow type spark plug. Manufactured by Stewart-Warner. 24 V D. C. - Can operate on 6 Volt. Ideal for Auto, Boats, Light Aircraft, etc. A STEAL AT ONLY \$6.95

Selsyn Mtr. Transformers

For Remote Control G. E. Model 21.1G.1 57.5 volts, 400 cycle #514 Can be used on 110 volt. Pr. Cost \$60.00 - Our Price \$3.95

MICARTA TUBE

Ideal for Insulating or Bushing Stock. 36" x 1/4" wall x 1" O. D. Original use was for trailing antenna. F 10. Use for tower rack, souvenir displays, shafting spacers, bearings, etc. In original carton. 59¢ ea.

S & K ROLL-A-WAY TOOL CARRIER

Not Tippy, but made of heavy gauge red crackle finish steel. 32"x27"x19" With 1 dividing drawer. 1 drawer with clamp-on rack for tools. Locks on upper drawer and pull out lid for locking lower chamber with drawer. Rubber Wheel Ball Bearing Swivel Castors with 2 Extra Portable Tool Trays. We have 80 of 'em now, but they won't last long at COMPLETE UNIT \$32.95

GAS ENGINES HERE'S A TERRIFIC VALUE PARADE IN CHEAP POWER.

10 H. P. CONTINENTAL GAS ENGINE 4 cylinder, Magneto Spark, built in Gas Tank. Water Cooled with Radiator. Complete with Tachometer and mounted on heavy steel frame for portability. A very smooth running job. Used but in guaranteed condition. Above engine used to drive pump described and priced below \$175.00

AIR COMPRESSOR

Thousands now in use for spraying, inflating, tractors, trucks, garage, laboratory, air tools, industrial use, etc. Lightweight but powerful, can be run by 1/2 H. P. Motor or Gas Engine. Operates efficiently in either or rotation. Gives approximately 3.27 CFM at 600 RPM, 6.54 CFM displacement at 1200 RPM. Has 2 inch bore, 1 1/2 inch stroke. Suggested pressure 75 P.S.I. Size 9" x 12" x 16" Weight approximately 23 pounds. \$21.95

AT THIS NEW LOW PRICE

Motors, Tanks, Fittings to Adapt this Unit also Avble.

POWER UNIT

The Complete Model GKB 12-24-100 Consists of a Single Cylinder, Air-Cooled, Four-Cycle Briggs-Stratton Gasoline Engine, Type-Single Cylinder, Air Cooled, L-Head, Four-Cycle, 6 H. P. Bore 3", Stroke, 3 1/4". Governed for Speed Between 1500 - 3200 R. P. M.

Directly Connected to a Direct Current Generator of 2800 Watts, Rating 28.5 Volts, 100 Amps, to form an Integral Unit. Fuel Container 1 1/2 Gallons.

The Engine and Generator are Mounted on Four Shock Absorbing Rubber Motor Mounts Attached to a Channel Iron Base. 4 Wheeled for Mobility can be used as Lighting Plant or Power Supply. A TERRIFIC VALUE! THE BUY OF THE CENTURY. ONLY \$79.89

Vickers Hydrlic Transmission VT-1

Sell contained, 2 H. P. constant torque at all speeds with variable volume reversible, piston pump (controlled by outside lever) supplying piston hydraulic motor. Automatic pressure, dash pot for smooth control. Power output R. P. M. - O to 1/2 input R. P. M. in both directions. Input R. P. M. 1800 continuous 4000 intermittent. Dash pot can be removed for greater R. P. M. Ideal for Lathes, Duplicator Setup on Mills, Conveyors, Small Cars, Drives, Gearing, Etc.

COST GOVERNMENT APP. \$400.00

You'll Chortle when you get it for ONLY \$19.50

Universal Joints, Gear Trains, Power Take-Offs, Drives Applicable to a multitude of adaptations, also Available.

GEAR BOXES

VTG-1-90° 1 1/2 to 1 bevel gear reduction, 1 1/2" dia. with lever control for engaging & disengaging positive clutch, dust proof housing, pre-lubricated, bronze size 7"x8" A lifetime value \$3.95

VTG-2-Inline spur gear reduction 16 to 1, thru 4 gears. Final take-off 4 1/2" dia. 26 teeth, 1/2" Alum. spur gear with lever control for engaging and disengaging positive clutch, dust proof housing, pre-lubricated, bearings, size 12"x8". Only \$6.49

Both above gear boxes can be used with above Transmission. 90°

FIRE EXTINGUISHER

Kiddie Lux Co2 Type. Built to Gov't spec. wirebound shatterproof Heavy Case. Fully recharged. 3" x 16" x 4" Trigger control with horn 478 type. \$35 Value \$13.25

2 lb. Co2 type \$11.75

10 lb. Charged with horn Co2 \$25.75

15 lb. Break Disc type New \$29.75

15 lb. Wheel Control \$32.95

15 lb. Squeeze grip. New \$39.95

All above Co2 type, fully charged and with horn. Indispensable for small or large planes, Trucks, Auto, Home, Factory Etc.

CARBON TETRACHLORIDE (Red)

The Best Cleaner you ever saw for parts and machinery. Also Fire Extinguisher fluid. In One Gallon Cans \$1.59 Gal.

GREENLEE - HAND TUBE BENDER

Designed for fast, free action, in bending steel, copper, brass, alum. tubing. Fits in std. vise up to 180 degree bend, makes smooth, small radius bends, free of kinks, scratches, etc. Available in the following sizes: 1/4" @ \$4.50, 5/16" @ \$4.95, 3/8" @ \$6.95, 1/2" @ \$8.25, 5/8" @ \$9.75, 3/4" @ \$11.25

Comp. Set of 6 Benders \$43.95

Electronic Transmissn. Gear Train

GT-1 Containing approx. 50 Bronze Spur & Pinion Gears ranging from 3/8" to 4" dia. 5 sets of 7 cluster gears. 2 complete worm & worm gear drive sets. 40 N. D. ball bearings from 1/2" to 1 1/2" dia. watch springs, bushings, posts, face plates, housings, Micro Switches. 2 miniature, controlled clutches, etc. 19 lbs. of Pleasure and profit. \$8.49

A Tremendous Gadget Mine. Only Gears in above train are all in multiple size and sequence with identical teeth ratio giving hundreds of ideal gear reduction combinations.

NEW PRESSURE TANKS

Stainless Steel - Shatter Proof. Rustless. 10,000 available in 6 different sizes. 1001 uses. G-1 12 1/2" x 24 inches 2100 Cu. in. capacity \$4.75

D-2 8 1/2" x 24 in. - 500 Cu. in. capacity \$2.49

F-1 10" x 18" 1000 Cu. in. capacity \$3.95

F-2 8 x 45 in. - 1000 Cu. in. capacity \$3.95

A-4 5" x 8" 104 cu. Capacity \$1.35

A-6 5 1/2" x 15" 280 cu. in. Capacity \$1.95

Excellent portable tanks for emergency use in car or motor ideal for painting, cooking, spraying, ocean buoys, underwater fishing or diving. #OR-1 Oxygen Regulator with 500 lb. gauge will fit all tanks \$1.39

New Electric Motors

#500 new 1/2 H.P. 27 Volt D. C. 24 Volt A. C. This motor can be readily adapted to 110 A. C. by the simple method of rearranging armature brush leads. We furnish free diagram of instructions with each order. A Sensational Value @ \$5.95

Converted to 110 A. C. Equipped with plug and 3/4" ft. Heavy Duty Cord \$8.49 ea.

1/6 H. P. 24 Volt D. C. Motor Series Wound. New. #501. \$3.95 ea.

#502 - 2 H.P. 24 V D.C.M. used. \$8.95

U. S. ELECTRICAL 28V MOTOR 1 1/2 H.P., 8400 R.P.M., 16.5 Amps. Continuous Duty \$5.49 ea.

BATTERIES

#516 9 Volt 8 1/2" x 6 x 4 in. 3 run 24 or 27 Volt motor. 79¢

NEW! FULL STRENGTH FOR PORTABLE RADIOS, SIGNAL LAMPS, BOATS, ELECTRIC TRANS. ETC.

Order Direct From This Ad. All Sales Final. All Prices F.O.B. Los Angeles. Pay by M. O. or Ck. P.O.'s Acptd. from D & B Bid. Firms. 1/3 Dep. with C.O.D. Now available New 1949 Edition. 90 Page Freely Illustrated Catalogue Containing Many Valuable information tables, Computations, Data, Etc. Send 25c to cover handling. Mailing, Etc.

THE GREATEST
THING

IN
PLASTICS!

PLASTICAST



A NEW HOME INDUSTRY AND HOBBY!

PLASTICAST is a transparent liquid plastic; can be poured into ANY kind of mold or container. Hardens in a few minutes into a transparent solid, clear-as-glass, tough as steel plastic! No tools, machinery or skill required. IDEAL for imbedding pretty flowers, butterflies, photos, medals, souvenirs, biological specimens, etc. Makes a **PERMANENT and ATTRACTIVE** display. Make attractive jewelry, gems, lenses, knick-knacks, novelties. Easily cast into sheets, rods, blocks, ANY color, ANY shape! **EVERYTHING** furnished, including molds, for making about \$50.00 worth of **unusual novelties!** **PLASTICAST OUTFIT, Complete with 3 molds \$3.50**

PLASTIDUR . . . (LIQUID IVORY). Ideal for casting all OPAQUE articles. Hardens in a few minutes into an extremely hard IVORY-like plastic! May be dyed any color or cast into any shape. Works in **EVERY** type of mold! Non-inflammable, waterproof, DURABLE. Ideal for statuary, novelties, figurines, toys, gadgets, tools, knobs, bases . . . a million useful applications! Outfit comes complete with molds, dyes, accessories, instructions, etc. for making about \$100.00 worth of attractive jewelry, etc! **\$5.00**

PLASTIDUR OUTFIT, Complete with 3 molds . . . \$5.00
BE A PLASTICS MANUFACTURER . . . Sell your output on **CONTRACT** basis! We show you what to make and how.

Our Casting Plastics are as easy to use as pouring water out of a glass!
TERMS: We pay the postage (U.S.A. & Canada only) if full cash accompanies your order. C.O.D. accepted (U.S.A. only) if \$1.00 deposit is included for each item ordered. C.O.D. orders not postpaid.

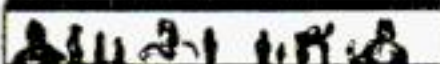
FREE

A very attractive and useful novelty made with one of our plastics given absolutely free with every one of our catalogs! Catalog lists many new materials for making **MOLDS and CASTINGS** with Liquid Plastics, Liquid Marble, Latex, Elastex, Castwood, Wax, Metals, Plaster, Shellcraft, Internal Carving, Molds, Moulage, etc. Price of catalog only 10c.

DEALERS: WRITE FOR ATTRACTIVE WHOLESALE PRICE LISTS
PLASTICAST CO. (Dept. A)
4637 N. Kedzie Ave. Chicago 25, Illinois (Order by mail only) P. O. Box 987 Palo Alto, Calif.

BE YOUR OWN BOSS!

We Show You How To Set Up Your Own
Profitable Mfg. Business



CASTING NOVELTIES FOR MONEY

with Complete Tested Instructions
as to how you can start your own
business even in your own home



Even In Spare Time
In Your Own Home

Here's Your big opportunity. Exciting chance to start your own business even at home. No experience or special education needed. "Casting Novelties For Money" tells all. Every page chock-full of ideas . . . tested ideas hundreds of men and women have used to make big money. Every chapter just bulging with ideas for your financial freedom. Here's some of them: • Picture directions on how to make your own flexible rubber molds for large novelties. • Making hollow casting all types of novelties. • Step-by-step photo and word instructions for making professional reinforcement shells for your molds. A big Must when casting castings for piggy banks, etc. Speed production methods explained. • How to preserve a precious baby's handprint in plaster

plaque form. • Tells what Liquid Marble is and its uses for novelties and tiles. • Complete chapter on Floc-Rite, the amazing new material of 1001 uses. With colorful Floc-Rite you can create surfaces that take on the appearance of plush, velvet, velour, or suede. Big full page of complete color samples of actual Floc-Rite. • A complete chapter on "Selling Aids" is most valuable if you're now in the Mfg. business or plan to get into it. Space limits us to properly do justice to this booklet. We'd like you to have this marvelous booklet free but high printing cost forces us to send it only to those who mean business and are not mere curiosity seekers. Thus the \$1.00 price. If not more than completely satisfied, return booklet in one week and we will refund your \$1.00 promptly. Or if you feel that it means your financial independence, keep it, and you'll get \$1.00 credit on your first \$5.00 materials order. Can we make it any easier for you to reap big profits in a business of your own? Send your \$1.00 today . . . check, cash or money-order. Tomorrow You Be The Boss.

BING PRODUCTS, Dept. PS3F, 88 Broad St., Boston, Mass.

ELECTRIFY your SEWING MACHINE



COMPLETE KIT ONLY
\$14.95

90 DAY GUARANTEE
Now, make mother's or wife's sewing a pleasure. Easy to install. Fits ALL machines.

- Motor & Bracket • 7 Speed Foot Control
- AC-DC 60c. 115v. • Cord Set
- PULLEY & BELT • Complete Instructions

SEND NO MONEY. pay postman plus C.O.D. or enclose money order and we will pay postage. MONEY BACK after five days if not completely satisfied. Shipping Wt. 6 lbs. State whether wheel on your machine turns towards or away from you.

2-TONE LUGGAGE CARRYING CASE \$9.95
Specify base width, length and make of your machine. Wt. 11 lbs.



FREE CHROME plated SEWLITE as (illus.) plus an extra long wearing rubber belt.

CONTINENTAL SALES COMPANY:
Dept. PS2, 666 Madison Ave., New York 21, N.Y.

An ASSURED FUTURE for You Learn Profitable WATCH REPAIRING

BIG MONEY WHILE LEARNING
Study at Home — or at Our Accredited School
Complete Home Correspondence Course or G. I. Approved Residence School Plan. Also, Post-Graduate Plan at school for correspondence students.

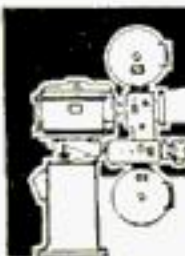
Write Today for COMPLETE DETAILS to
American Institute of Specialized Watch Repair
Dept. 200 270-76 East Building, Grand Rapids, Michigan

Learn SHOE REPAIRING

PRACTICAL SHOP TRAINING

• Excellent opportunities for good jobs or a successful business of your own. Prepare quickly—practical shop work and shop management taught by experts. Here is a field for a man who wants to be his own boss and build an independent future. Approved for Veterans. Help in finding part time work while a student, employment service to graduates. Write today for FREE information.

CHICAGO SCHOOL OF SHOE REBUILDING
124 E. 26th St. Dept. PS-3 Chicago 16, Illinois



LEARN MOVIE PROJECTION THEATRE MANAGEMENT

The Motion Picture Theatre Business offers big opportunities for trained men. Get into a fascinating field with a promising future. Train at home in spare time. Free Catalog. Established 22 years.

THEATRE INSTITUTE, 385 Washington St., Elmira, New York

Learn PHOTOGRAPHY

Win success in photography by spare time Home Study or at our famous Resident School in the heart of New York. Commercial, Advertising, Portrait, Color, etc. 39th year. Write today!

NEW YORK INSTITUTE OF PHOTOGRAPHY

Dept. "5", 10 W. 33 St., N. Y. 1, N. Y.

Says Man Has Strange Powers That Work While He Sleeps

A STRANGE MAN in Los Angeles, known as "The Voice of Two Worlds," reveals the story of a remarkable system that often leads to improvement in power of mind, achievement of brilliant business and professional success and new happiness. Many report improvement in health. Others tell of increased bodily strength, magnetic personality, courage and poise.

The man, a well-known explorer and geographer, tells how he found these strange methods in far-off and mysterious Tibet, often called the land of miracles by the few travelers permitted to visit it. He discloses how he learned rare wisdom and long hidden practices, closely guarded for three thousand years by the sages, which enabled many to perform amazing feats. He maintains that these immense powers are latent in all of us, and that methods for using them are now simplified so that they can be used by almost any person with ordinary intelligence.

He maintains that man, instead of being limited by a one-man-power-mind, has within him the mind-power of a thousand men or more as well as the energy-power of the universe which can be used in his daily affairs. He states that this sleeping giant of mind-power, when awakened, can make man capable of surprising accomplishments, from the prolonging of youth to success in many fields. Strangely, he says that this power works best while we sleep, when proper methods are used.

The author states the time has come for this long-hidden system to be disclosed to the Western world, and offers to send his amazing 9000-word treatise which reveals many startling results—to readers of this paper, free of cost or obligation. For your free copy, address the Institute of Mentalphysics, 213 South Hobart Blvd., Dept. 43-H, Los Angeles 4, Calif. Readers are urged to write promptly, as only a limited number of the free treatises have been printed.

ANALYZE Handwriting

Uncrowded, fascinating field. Gratifying earnings reported by graduates in Employment, Credit, Social Service, Police and Entertainment fields. Others have developed profitable private practice, full or spare time, as Personal Problem and Vocational Counselors. Send for 3000 word TEST LESSON and Grapho Analyst FREE.

A. I. G. A. Inc., Wilholt Bldg., Dept. 126, Springfield, Mo.



\$4.95

REAL ENGINE VALUE



A miniature gas engine that really operates. Thousands of Buzz "B" gasoline engines have been sold at twice the price. Now is your chance to buy a real 1/8th H.P. gas engine for only \$4.95. Turns up over 8,000 rpm. For Boats, planes, midget cars, etc. Guaranteed and ready to run. Includes Champion spark plug and tank. Send only \$1.00, engine shipped collect for balance, same day. Write for free catalog or SEND 10c FOR NEW MAMMOTH ILLUSTRATED CATALOG OF THOUSANDS OF HOBBY ITEMS.

America's Hobby Center, Inc., Dept. S-39, 156 West 22 St., N. Y. 11

CREI Prepares Young Men for Professional Careers with Industry-Recognized training in a minimum of time

RADIO-ELECTRONICS-TELEVISION ENGINEERING

GRADUATES of the Capitol Radio Engineering Institute residence school are preferred by industry because of their training and ability. This recognition is the reason that CREI men quickly find good jobs in radio-electronics-television engineering and technical fields.

With 22 years of practical teaching experience in these highly technical fields, CREI offers an outstanding faculty, modern and complete laboratories, shops and equipment.

New students are accepted twice monthly and each may advance as rapidly as he is capable. The basic

course with one specialized course requires an average of 20 months to complete, depending on the ability of the individual student.

CREI is recognized as one of the country's leading technical institutes. Its work is of college level. It prepares the young man for a good job in industry in a minimum of time.

Approved for
Veterans' Training



CAPITOL RADIO ENGINEERING INSTITUTE
An Accredited Technical Institute Founded in 1927
Dept. 183A, 16th and Park Rd., N. W., Washington 10, D. C.

MAIL COUPON FOR FREE CATALOG

Capitol Radio Engineering Institute, Dept. 183A
16th and Park Rd., N.W., Washington 10, D. C.

Please send me your illustrated catalog and complete details.

Name _____ Age _____

Street _____

City _____ Zone _____ State _____

☐ I am entitled to training under G.I. Bill

**Now
for EVERY WORK SHOP!**

**NEW
Invention**

Electroplates by BRUSH



**Easy to Plate CHROMIUM
GOLD, SILVER, NICKEL, COPPER
... For Pleasure and Profit!**

If you have a workshop—at home or in business—you need this new Warner Electroplater. At the stroke of an electrified brush, you can electroplate models and projects—you can replate worn articles, faucets, tools, fixtures, silverware, etc. with a durable, sparkling coat of metal... Gold, Silver, Chromium, Nickel, Copper or Cadmium. Method is easy, simple, quick. Everything furnished—equipment complete, ready for use. By doing a bit of work for others, your machine can pay for itself within a week. So make your shop complete by getting a Warner Electroplater right away. Send today for FREE SAMPLE and illustrated literature. ACT AT ONCE! Mail Coupon.

**WARNER ELECTRIC CO., DEPT. A-6
1512 Jarvis Avenue, Chicago 26, Ill.**

FREE Details & Sample!

WARNER ELECTRIC CO., 1512 Jarvis Avenue, Chicago 26, Dept. A-6
Gentlemen: Send Free Sample and Details to:

Name _____

Address _____

City _____

State _____

**NO SQUINTING OR
GUESSING With
This Steel Tape!**



The sharp contrast of the jet black numerals on the white crack-proof protective coating on the Brite-Blade makes it easy to read a measurement even in poorly lighted places. This porcelain-like finish is impervious to acids, oils and dampness. The rugged case is chrome plated and its design and "feel" makes it a favorite among men who want and demand only the finest in tools. 6 or 8 foot lengths. Blades replaceable. See your hardware dealer or use coupon.

MASTER

REG. U.S. PAT. OFF.

WOOD AND STEEL TAPE RULES

MASTER RULE MFG. CO., INC.
201 Main Street, White Plains, New York

P.S. 3

Please send me

306W— 6 ft. Brite-Blade—\$1.75
308W— 8 ft. Brite-Blade—\$1.90
310W—10 ft. Brite-Blade—\$2.25

My check (or Money Order) is enclosed.

NAME _____

ADDRESS _____

CITY _____

STATE _____

LOOK!

**DO FACTORY FINISH PAINTING WITH THIS
AMAZING, ALL-ALUMINUM, LOW COST
PAINT SPRAYING UNIT**



**Factory Set—Easy to Operate
FOR PAINT, LACQUER,
STAIN AND WAX
Needs No Cleaning!**



Complete with
AIR COMPRESSOR
6 FT. THICK-WALL HOSE
2-6 OZ. CONTAINERS
WITH JET CAPS
LIFETIME
COLOR-DABBER HANDLE
FULL INSTRUCTIONS
WITH UNIT
A Cesco Product

Spray automobile fenders, furniture, woodwork, machinery, etc. 50 lb. pressure obtained with easy foot-operated compressor—needs pumping only at intervals to keep air supply constant. Containers may be refilled as often as required. Disposable spray jets. Perfect for home use or in automotive repair shops, woodworking shops, factories, boat yards, hobby shops, etc. Entire unit weighs only 3 lbs.

ALL FOR
\$9.95
POSTPAID

**THE HOWARD COMPANY
Dept. 23, 615 Davis St.
Evanston, Illinois**

MONEY BACK GUARANTEE

LOOK!

FIN-DER SAX-SLING

**NEVER SLIP OR KINK
HIGH SPEED ADJUSTING
BALLBEARING**

\$1.00

**AT ALL GOOD DEALERS
OR ORDER DIRECT**

NEW!

FIN-DER 1253 - 4th Avenue, San Diego 1, Calif.

HAUCK FLAME GUN KILLS WEEDS



KILL WEEDS, crab grass, Canada thistle—stalks, seeds and roots. Destroy brush, caterpillar nests, diseased trees, grasshoppers, chinch bugs, etc. Clear irrigation ditches, split rocks, burn tree stumps... Sterilize poultry houses, kennels, barns. Use as portable home forge. Melt ice, thaw pipes. Safe, inexpensive. Burns only 6¢ kerosene, 94% air! Thousands satisfied users. 7 models. Write for FREE CATALOG.

HAUCK MFG. CO., 81 Tenth St., Brooklyn 15, N. Y.

BUILD ARC-WELDER

PLAN A—Operates from 110 or 220 volts A.C. for light or heavy work. Has 20 heats. Uses coils from old auto generator. Rewinding unnecessary.

PLAN B—Made from old generator and is for light or heavy work. No previous experience needed.

SEND 35c for either plan complete, including Catalog of Electrical Bargains.

PLAN 35c

LEJAY MFG. CO., 1323 LeJay Bldg., Minneapolis 8, Minn.

**One Swipe of NEW PLASTIC
Makes these LEATHER and
LEATHERETTE Items LIKE NEW**

Get Into A Money Making Business

Make like new, worn, scuffed or faded leather and artificial leather equipment. Either your own to renew, recolor and beautify, or cafe, restaurant and hotel equipment as a business. Single stroke with a brush renews. Does not crack, peel or scuff. Resists acid, alcohol, caustics and weather. All colors. Mail coupon for free sample.



FREE Sample SHOWS EFFECT

**\$50 to \$500 Profit
On One Job Possible**

Let me show you how, as I have shown others. Get your own exclusive territory while available. Mail coupon today, I'll do the rest. — Jack Edwards, Sales Mgr.

**LEATHER-NEW PRODUCTS,
6082 Suney Slope, Kansas City, Mo.**
Send me without obligation a sample of Leather-New coated material so I can inspect it.

Name _____

Address _____

City _____

State _____

CARTWRIGHT'S Patented TRU-CUT TIN SNIPS

Easiest cutting tin snip. Handy tool for 1,001 jobs. Lightweight—will cut 18 gauge sheet metal. Very finest for cutting metal accurately to any simple or complex pattern.

Prompt
Delivery

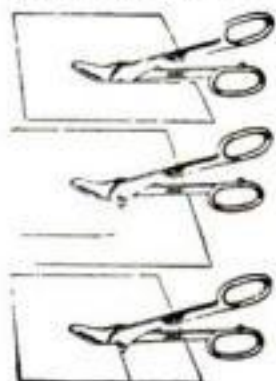


\$4.95
ea.

Post-
paid on
cash orders

Check These 7 Tru-Cut Features

1. Cuts a perfect circle, right or left. 2. Cuts square points, both ways, right or left. 3. Hands are always above material when cutting. 4. TRU-CUT Snips are patented and protected by J. Cartwright & Son, in business since 1885. 5. Tool is guaranteed against mechanical defects and will be replaced upon returning to factory. 6. Special "Cup Tension Washer" designed and made for TRU-CUT retains a tight fit. 7. Faster cutting. Truer cutting. Easier cutting. Less tiring. Stay Sharp Longer and will give Years of Service. Get this easy time-saving snip today. If dealer can't supply order direct from us. Send cash, check or money order, and we pay postage. SATISFACTION GUARANTEED. \$1.00 deposit on C.O.D.'s.



1. TRU-CUT fits the hand. Well balanced. Weighs only 2 lbs. 2. TRU-CUT will cut inside circle without wrinkling metal. 3. TRU-CUT cuts square points both ways on inside cuts.

Write for FREE CATALOG of complete line of pruning shears and hedge shears



J. CARTWRIGHT & SON

Dept. SP-3

Malaga

California

LOOK for Rupture Help

Try a Brooks Patented Air Cushion appliance. This marvelous invention for most forms of reducible rupture is GUARANTEED to bring YOU heavenly comfort and security—day and night—at work and at play—or it costs you NOTHING! Thousands happy. Light, neat-fitting. No hard pads or springs. For men, women, and children. Durable, cheap. Sent on trial to prove it. Not sold in stores. Beware of imitations. Write for Free Book on Rupture, no-risk trial order plan, and Proof of Results. Ready for you NOW!



BROOKS APPLIANCE COMPANY

Dept. 163-C

State St.

Marshall, Mich.

*Trained Men Get the Better Jobs
in the Automotive Industry*

PRACTICAL SHOP TRAINING

*in AUTOMOTIVE MECHANICS
BODY and FENDER REBUILDING*

If interested write or wire

**ATLANTA MOTIVE TRADES
INSTITUTE** Dept. C, 254 IVY St., N.E.
Atlanta, Georgia

Member of the Southern Association of Private Trade Schools

Veterans ask about G I Training

SCREWY-MIX BARGAINS

Handy Workshop Kits—All New Finest Quality

1—Assorted machine screws, sheet metal screws and bolts, sizes 2-56 to 3/8-24, various type heads. 3 lb. \$1.15—5 lb. \$1.50.

2—Mixed Steel Rivets 1/16" to 1/4" diameter, various lengths, round and flat heads—five pound pkgs. \$1.00.

3—Mixed aluminum rivets—50c lb. Mixed cotter pins 35c lb.

BEARINGS

Bore	O.D.	Type	Price
5/32"	5/8"	Ball	.15
3/16"	1/2"	Needle	.15
1/4"	5/8"	Needle	.15
1/2"	3/4"	Ball	.22
1"	1 1/4"	Needle	.28

Minimum order \$1.50. Add 10c per lb. for postage.

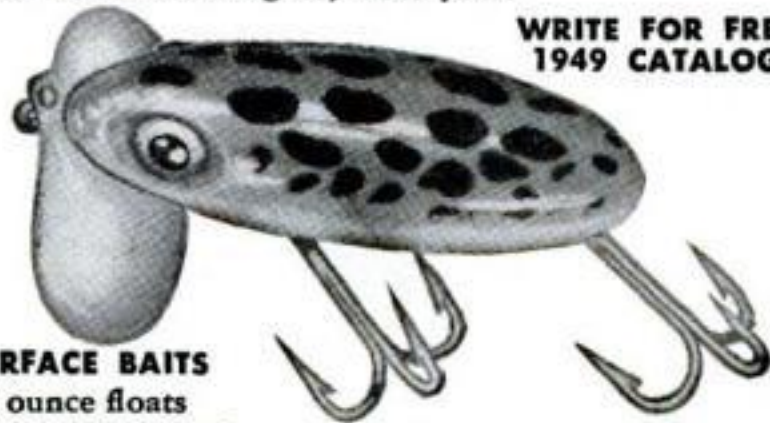
JAY-CEE SALES CO., 4554 Grand River Ave., Detroit 8, Michigan

ALL BROKE WATER TO TAKE JITTERBUG!



"Our Jitterbug took the limit, each day, at St. Potier Lake, near Whitefish," is the way T. B. Stonerock of Dayton, Ohio, describes this photograph showing his son, Tommy (right), and friend, Peter Farrell (left), with their catch of Smallmouth Bass . . . all weighing over 2 pounds. Mr. Stonerock, the boys and a Jitterbug have a date to fish St. Potier Lake again, next year.

**WRITE FOR FREE
1949 CATALOG**



SURFACE BAITS

3/8 ounce floats

3/8 ounce sinks when at rest

Either size.....\$1.21 each

Colors: Red Head, Frog, Black, Yellow, Scale, Perch, Pearl, Luminous, Blue Head, Pearl Herringbone

Try the new 1 1/4 ounce Musky Jitterbug.....\$2.00 each

Jitterbug—T. M. Reg. U.S. Pat. Off.

A-349-18

FRED ARBOGAST & CO., INC.

1733 W. North St., Akron 3, Ohio

New!

FOR
PLEASURE
CARS

Fits Under Car Hood!

GROVER AIR HORNS

NOW, a powerful, more compact...
GET easily installed high pressure air horn and air tank assembly that fits on firewall or side splash pan under car hood!
FACTS Spun brass bells, true-tone harmony, heard for miles! Complete assembly features two matched GROVER air horns, self-filling air pressure reserve tank, bronze diaphragms, brass valve, control handle and all necessary copper tubing, rubber hose and fittings. Instructions furnished. Satisfaction guaranteed. If your dealer cannot supply you, write for facts NOW with make, model and year of your car to
GROVER PRODUCTS CO., 1219 So. Hope St., Los Angeles 15, Calif.

DEALERS
JOBBERS
INQUIRIES
INVITED

\$5000.

of Old Line Legal Reserve LIFE INSURANCE

FOR ONLY \$4.50 A MONTH*

AT AGE 21 (other ages in proportion)

*One Half Permanent Rate in effect 5th year

Or you can buy as little as \$1500 of this unique protection at only 90c per \$1000. Policy offers all Standard Provisions under rigid N. Y. State Insurance Laws.

For 42 years POSTAL has sold life insurance by mail and over the counter; has satisfied policy-holders in every state; has over \$14,000,000 in assets and has paid out over \$62,000,000 in benefits.

All Standard Policies, men or women, ages 10-60 at low cost.

DIVIDENDS, payable annually, further reduce the low cost of your insurance. Send coupon for further details and rates. Life Insurance is vital!

GET THE FACTS BY MAIL

POSTAL LIFE INSURANCE COMPANY

511 Fifth Avenue, New York 17, N. Y.—Dept. M-863

Mail me without obligation complete information about your low cost "Modified 4 Policy" at my age.

Name.....

Occupation.....Date of Birth.....

Address.....

NO SHOP
NEEDED

Operate YOUR OWN Business



Clean and Mothproof Rugs and Upholstery

SEE OUR SERVICE "AD" IN MARCH ISSUE OF McCALL'S

Can you qualify? . . . If you are dependable, honest and willing to work, send for FREE Booklet explaining how you can become "your own boss" in a growing business of your own. You'll use proven successful methods of established DURACLEAN Dealers. Service rendered "in the home," offices and public buildings. Easy to learn. No experience necessary.

DURACLEAN cleans by absorption! No scrubbing. No soaking or shrinkage. Fabrics dry in just a few hours. Dirt, grease and many unsightly spots vanish as if by magic . . . colors revive. Upholstery and floor coverings last longer.

DURAPROOF kills moths and carpet beetles. Makes material resistant to both! Another year 'round service rendered "In the Home." DURAPROOF, to our knowledge, is the only moth proof service backed by a Money Back, 4 YEAR WARRANTY.

These services are Nationally Advertised! Leading furniture and department stores recommend DURACLEAN Dealer's service. Almost every building in your territory houses a potential customer. Even auto dealers buy your service to revive upholstery in used cars. You get many voluntary and repeat orders.

Some dealers establish a shop or an office after business has grown. Others continue to operate from their own home. Profits up to \$15 and \$20 for a day's service on EACH of your service men.

Territories are limited! Write now for FREE Booklet explaining details of these Nationally Advertised services.

Duraclean Co., 18-3 Pl. Deerfield, Illinois

PRINT YOUR OWN POST CARDS

COMPLETE
OUTFIT

only

\$7.50

Amazing results in sales, inquiries and contacts . . . saves time and money . . . very easy to use GEM STENCIL DUPLICATOR is ideal for Advertising, Announcements, Notices, Labels, Forms, Price Lists—hundreds of uses for every type of business and organization. Comes complete with all supplies, instructions and 60-page Book of Ideas.

FREE TRIAL OFFER: Try it before you buy it! Write and a GEM OUTFIT will be sent you postpaid After 10 days, send only \$7.50 or return the GEM, no questions asked. The GEM must sell itself; you be the judge.

BOND EQUIPMENT CO. • Dept. 151

6633 Enright • St. Louis 5, Mo.

SEND NO MONEY • FREE TRIAL OFFER

If Ruptured



Do What Others Now Do—

**Wear a Form Fitting
MILLER Truss**

which provides natural freedom and comfort in working, walking, playing, horse back riding, dancing, swimming or sleeping. You just cannot afford to be without this protection and convenience.

Wear two weeks then consult your physician before deciding to keep it.

Write me today for **FREE** descriptive circular. Sent in plain, sealed envelope.

FRED B. MILLER Manufacturer
Dept. P.S. Hagerstown, Maryland.



MING TREE KIT

Complete kit including imported Chinese figure and all material to make and decorate tree. Simple instructions furnished. This beautiful home decoration needs no water or attention, is everlasting and amazingly lifelike. Ideal project for hobbyist, or make for profit. Small kit \$2.45. Large kit \$4.95. Sent postpaid in U.S.A. Send check or money order.

Dealer prices on request

ORIENTAL GARDENS
1491 East Colorado, Pasadena 4, Calif.



PATENTS

AND TRADE MARKS

C. A. SNOW & CO.

REGISTERED PATENT ATTORNEYS

WRITE FOR INFORMATION TO

246 SNOW BUILDING, WASHINGTON 1, D. C.



MAIL THIS COUPON

D. Van Nostrand Co., Inc. Pop. Sci.-Mar. '49
250 Fourth Ave., New York 3, N. Y.

Please send me a copy of "Residential Wiring" for FREE EXAMINATION—the big brand-new book that tells all about planning, installing, testing, Code requirements, etc. After 10 days I will either return the book or send you \$5.95, plus a few cents postage.

Name.....

Address.....

City.....State.....



Mows and Trims Lawns



In One Simple
Easy Operation
8 1/4 Lbs.



Save Time
and Labor with a

MONTAMOWER

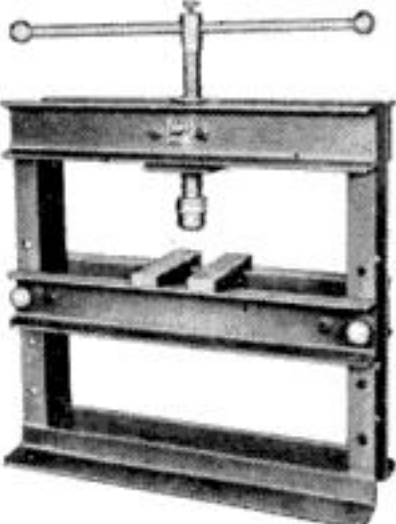
New model. New type metal handle has special device to adjust cutting height. Drive shaft now mounted on free rolling, factory lubricated, sealed ball bearings. No tired backs or aching arms. 8 1/4 lbs. live precision made mechanism that first gathers, then cuts smoothly a clean 16" swath through grass, dandelions, spike grass, lawn weeds. No noise or clatter. As modern and efficient as your electric razor. Cuts right up to walls, fences, trees or posts; leaves no fringes to be trimmed by hand. Cutters self-sharpening. Built to last many years. Many thousands in use. Sold direct from factory for 26 years. Costs little. Write at once for trial on your own lawn "approval offer," guarantee information and literature.

MONTAMOWER DISTRIBUTING CO.

63 Keeler Bldg. GRAND RAPIDS 2, MICHIGAN

A 10-Ton Press at Low Cost

Pressing, separating, bending, and straightening jobs in your shop are easy with this press. Ten-ton capacity provides ample pressure. Adjustable table takes work up to 18 inches wide and 11 1/2 inches high. Send for free bulletin showing press and wide variety of accessories.



UT-10A Press f.o.b. factory \$31.00

DAKE ENGINE COMPANY

622 Seventh Street, Grand Haven, Michigan

FOR BIG MEN ONLY!



SHOES
IN SIZES 10 to 16

We specialize in large sizes only—sizes 10 to 16; widths AAA to EEE. Wing tips, Loafers, Mocassins, Hand Woven Oxfords, Dress Oxfords, High Dress Shoes, Work Shoes, Sox. Styling specially designed for large sizes. Satisfaction guaranteed. Sold by mail only. Write now for FREE catalog.

Write
For
FREE
CATALOG

KING-SIZE, INC., 799 BROCKTON, MASS.

New MIRACLE WALL CLEANER



Saves Costly Redecorating!

AMAZING INVENTION. Banishes old-style housecleaning mess and muss. No rags—no sticky "dough"—no red, swollen hands. No more dangerous stepladders. Literally erases dirt like magic from walls, ceilings, window shades, upholstered furniture, etc. Ends drudgery! SAVES REDECORATING!

SAMPLES FOR AGENTS

Sample offer sent immediately to all who send name at once. A penny postal will do. SEND NO MONEY—just your name. KRISTEE CO., 721 Bar Street, AKRON, OHIO.

PICK OUT THE MAN WHO FISHES WITH A Shakespeare WONDEREEL



Long Casts Without Backlash

3-WAY SPIN CONTROL the Secret

Yes, sir, the happy fisherman is the WONDEREEL fisherman, because he gets long, accurate casts without backlash or thumbing . . . thanks to:

One: oversize tail end bearing, two: adjustable head end spool cap, and three: lightweight spool for easy starting, quick stopping.

These patented Shakespeare 3-Way Spin Control features prevent backlash, because they won't let spool and line outrun bait. That's why beginners learn to cast with Wonder reel in 5 minutes, why even experts are switching to it. In 3 models at sports stores.

FREE 1949 TACKLE BOOK and Pocket Fishing Calendar. Newest in Reels, Rods, Lines, Accessories, Fishing Tips. Write Shakespeare Company, Dept. 93, Kalamazoo 2, Michigan.

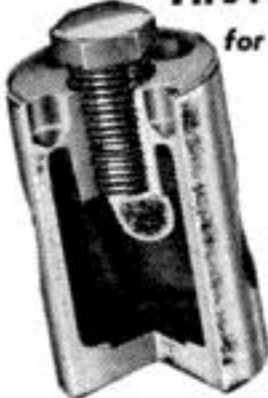
Shakespeare

FINE FISHING TACKLE
HONOR BUILT FOR OVER 50 YEARS

STOP TAPPET NOISE!

Install ADJUSTABLE TAPPETS

for FORD and MERCURY V-8's (85-100 HP)



Johnson Adjustable Tappets guarantee better engine performance! Over 2,000,000 of these popular tappets are giving quiet, trouble-free service.

Simple and easy to install during valve grinding jobs.

Nothing complicated . . . no extra labor involved.

ASK YOUR SERVICE MAN
OR NEAREST AUTOMOTIVE JOBBER TODAY

JOHNSON PRODUCTS INC.

Muskegon,
Michigan

MARCH 1949 93



AUTO

BOOKS ON APPROVAL



CAN YOU FIX IT?

These wonder books tell step by step HOW to make difficult repairs and adjustments, how to keep a car at maximum efficiency, including latest improvements in car design and operation. Engine troubles and how to correct them well covered.

4 BIG, THICK VOLUMES
Over 2700 pages, 2000 illustrations, wiring diagrams, etc. Beautiful modernistic, washable cloth binding.

AMERICAN TECHNICAL SOCIETY, Dept. A320
Drexel Ave., at 58th St., Chicago 37, Ill.

I would like to examine your 4 Volume Set of Auto Books. I will pay the delivery charges only, but if I choose I may return them express collect. If after 10 days' use I prefer to keep them, I will send you \$2 and pay the balance at the rate of only \$3 a month until \$24.80 has been paid. Include consulting service as offered above.

Name.....
Address.....
City..... State.....
Please attach letter stating age, occupation, employer's name and address, and name and address of at least one business man as reference. Men in service, also please give home address.

SEND NO MONEY. Just mail the coupon for a complete set of 4 Big, Thick Auto Books. 20th Edition. Over 2700 Pages! Whether you are a mechanic or helper, expert or apprentice, auto owner or driver, take immediate advantage of this **FREE EXAMINATION OFFER.**

MAKE GOOD MONEY NOW HOLD A PERMANENT JOB

America wants its automobiles kept in good repair. Men with "know how" are in demand, at big pay. These books will help you get and hold an important job, or give you a chance to go into business for yourself now or later. Any man who half tries to improve himself can learn auto servicing and repairing by this quick reference method. Use the **JIFFY INDEX** to find easily understood answer to any auto problem. These wonder books prepared by eleven of America's great automobile engineers. Many hundreds of valuable illustrations. Send the coupon **TODAY**

[A year's consulting privileges with our engineers now given with these books without extra charge.]

Publishers Since 1898

INVENTORS

When you are satisfied that you have invented a matter of value—write me, without obligation, for full information as to what steps you should take to secure a Patent. The usual first step is to have a search of the prior U.S. Patents conducted, so that I can report to you on the question of Patentability.

PATRICK D. BEAVERS
(Formerly RANDOLPH & BEAVERS)
Registered Patent Attorney

937 Columbian Building, Washington 1, D. C.

PATRICK D. BEAVERS, Registered Patent Atty.
937 Columbian Bldg., Washington 1, D. C.

Please send me full information on how to secure Patents & Trademark Registration.

Name.....
Street.....
City..... State.....



- HOME ASSEMBLED
- MASS PRODUCED
- LOW-COST AUTOMOBILE

WORLD'S LOWEST PRICED CAR

Drive this car for as low as 50¢ per week. Up to 90 miles per gallon. 45 to 50 m.p.h. Large enough for a husky six footer. A pleasure to assemble. Just bolt together our precision built parts. Get the facts. Send 25¢ for detailed circular with large photo, 4 view drawings, price of all parts. Better still, send \$1 (refunded first order) for this plus actual assembly book with 42 photos, drawings, blueprints of snow and ice conversions, etc.

MIDGET MOTORS MFG. CO., Athens 2, Ohio

AMES UNIVERSAL DIAL INDICATOR SETS

NEW SURPLUS

OUR PRICE
\$15.00

Reg. sold for
\$23.00



You get a complete set including Dial Gage with hole Attachment, Bar with Upright, Clamp sliding swivel, Dial holding rod and three contact points. Hole attachment also, can be adjusted to almost any position, and used in places inaccessible to ordinary indicators. All this along with a beautiful box for only \$15.00.

Write today before limited supply of these AMES KITS are exhausted.

183 Grand Street SID TOOL CO. New York, N. Y.

20 ASSORTED COMIC BOOKS—\$1.00

Amazing assortment of 20 different comics for young & old. All new, in full color, coverless. Standard titles; Western, Adventure, Love, Science, Mystery, Sport, Humor, Detective. Different selection every time you order. Sent postpaid anywhere in the world for only \$1.00. Immediate delivery. No C.O.D.'s.



WORLD COMICS • Box 69, Morris Hts. Sta., N. Y. 53, N. Y.

STAMMER?

This new 123-page book, "Stammering, Its Cause and Correction," describes the Bogue Unit Method for scientific correction of stammering and stuttering—successful for 48 years. **Free—no obligation.**

BENJAMIN N. BOGUE, Dept. 4915
Circle Tower Indianapolis 4, Ind.

GET THIS
FREE
BOOK!



RAISE HAMSTERS

The new wonder animals from Syria. Often called Toy Bears. Delightful pets. Everyone wants them. Laboratories need thousands. Clean, odorless. Raise anywhere. A profitable and interesting hobby or business. We furnish breeders and instructions. Write today for free book.

GULF HAMSTERY, 1540 BASIL ST., MOBILE, ALA.

EARN BIG MONEY AND BE YOUR OWN BOSS Sharpening Lawn Mowers

Build a Business of Your Own With A UNIVERSAL GRINDER

In your own garage or basement, and earn \$25.00 a day or more. Mr. Hardy writes, "I am doing a fine business with the UNIVERSAL GRINDER. One customer sends another. I spent 40c for a newspaper ad and have done nearly \$500.00 worth of business." Mr. Helmeck of Canada writes, "We sharpened 750 mowers last year and are 1056 on this years run. The Universal surely makes customers." Mr. Barton of California says, "The mower business, with the Universal Grinder, has been a gold mine these last two years."



Only on the UNIVERSAL GRINDER can the inside face and edge of the stationary blade, as well as the reel blades, be ground to proper clearance ALL IN ONE SET-UP without removing any blade from the mower.

Write for Free Folder TODAY!

ROGERS MFG. CO., Dept. P-39, Lindsey, Ohio

READY CUT HOMES

Order Now

Homes \$1835.00 and up. freight paid. Orders filled in order received. Save up to \$1000 on modern production method homes. Much more compared with builders' prices. Anyone can assemble with simple plans furnished. Complete. Including paint, hardware, roofing, glass, nails, etc. Send 35c in coin for full color catalogue showing 57 modern low-priced homes and floor plans. Low cost building plans complete ready for filing. Sold separately if desired.

NEW COLOR CATALOG FOR ONLY 35c

INTERNATIONAL MILL & TIMBER CO. Bay City, Mich.

New...Self-Contained SPRAY GUN

No Hose! No Tanks! No Pumps!
No Motor!

It's true! A high-pressure spray gun as self-contained, as compact and portable, as a flashlight! Uses no current. Pressure comes from inexpensive CO2 cartridge. A cartridge sprays 10 to 20 oz. of liquid (depending on viscosity). Use gun for paints, liquid insecticides, oils, etc. For home, farm, workshop, garden, garage. Comes with 3 cartridges. Fully guaranteed. The Becker Spray Gun is shipped postpaid for only \$18.50; or send only \$2—we'll ship C.O.D., you pay postman balance plus postage. Extra cartridges, 10 for \$1, postpaid.



\$18.50
(With 3 cartridges)
POSTPAID

SULLIVAN-BECKER CO., Dpt. 129-C, Kenosha, Wis.

LEARN CHEMISTRY AT HOME

The demand for men trained in chemistry is great. Big pay job opportunities are growing by leaps and bounds. If you want to get into this fast growing, fascinating, high pay field by studying chemistry at home, write today.

INSTITUTE OF PRACTICAL CHEMISTRY
2 PROSPECT AVENUE, HAGERSTOWN, MD.

ARE YOU NATURALLY INVENTIVE?

"Cash In" On Your Natural Talent
By Learning WHAT To Invent—

2100 Inventions Needed Now!

TURN your talents into CASH! Invent the simple things that people need and want!

The Kiddie Kar brought its inventor a cool MILLION dollars. A 70-year old grandmother made \$350,000 on an overall buckle. Others became independently wealthy by "dreaming up" the rubber pencil tip, the ordinary paper clip, the hair-pin, etc. YOU can cash in, too—if you concentrate your talent on the inventions that are really NEEDED!

The EASY Way to Get Started

Don't waste time and brain-work on something nobody wants! Find out WHAT to invent. A valuable book by Raymond F. Yates, noted science editor and inventor, lists and describes over 2100 PRACTICAL, money-making ideas that are crying aloud to be invented!

These 2100 ideas are the things most needed and surest to make money. They are listed under 34 different headings for quick reference: Electrical, Radio, Automotive, Agricultural, Building, Household, Clothing, Toys, Time-Savers, etc.

This book ALSO tells how to think inventively; how to PROTECT your ideas; how to develop an invention STEP-BY-STEP, etc.

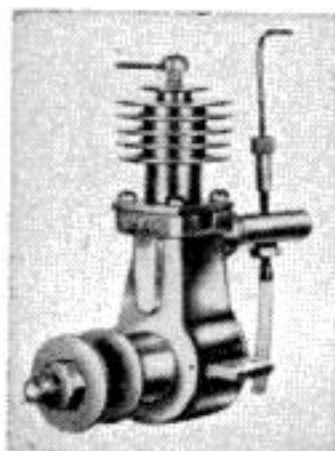
FREE 5-DAY EXAMINATION

Would YOU like a slice of the \$280,000,000 that American inventors get each year in royalties? Get started now! Just send a letter or postcard and get "2100 Needed Inventions," by Raymond F. Yates, for 5 days' FREE trial. If, even in that short time, you are not convinced this book can help you make money—just return it and owe nothing. Otherwise, send only \$2.50, plus few cents postage, as payment in full.

Any one of the 2100 ideas in this book can bring somebody a fortune. Maybe it can be YOU! Mail letter or postcard and get this book on FREE TRIAL at once! Wilfred Funk, Inc., Dept. T593, 227 East 44th Street, New York 17, N. Y.



REAL DIESEL ENGINE \$2.95



WE'RE CRAZY, they tell us, giving away a real diesel engine, complete with cylinder and piston, carburetor, crankshaft and connecting rod. All parts completely machined, ready for easy assembly. ONLY \$2.95. How do we do it? We're selling thousands of DEEZILS. So production's up; costs tumble down. DEEZIL is a precision engine. Actually runs at 7500 RPM. Produces 1/7 HP. Ideal for planes, boats, midget cars. Send \$2.95 plus 25c postage today.

GOTHAM HOBBY CORP.

107 East 126th Street New York 35, N. Y. Dept. "S"

YOUR KEY TO MORE MONEY in electrical maintenance and repair work



WAS there ever such an opportunity to get started in electrical maintenance and repair—and at top-notch wages? Others are getting just the sort of background needed—quick! practical!—to handle the great variety of electrical maintenance and repair work TODAY—from this well-known electrical library. You can too!

THE LIBRARY OF ELECTRICAL MAINTENANCE AND REPAIR

5 vols., 1826 pages, 1724 illustrations

Gives you the "know-how" to tackle any wiring or motor job. Five books show you HOW—to install all types of motor and generator units—to inspect and repair motor starters and generators—to diagnose motor and generator troubles—to rewind small two and three phase motors—small DC and AC windings—test induction motors, etc., etc. One book is full of trouble-shooting charts that show quickly symptoms, causes, specific remedies, etc.

Take the first step toward improving YOUR future—
MAIL this coupon TODAY

No money down—special price—easy payments—FREE trial

McGraw-Hill Book Co., Inc., 330 W 42 St., N. Y. 18, N. Y.

Send me for ten days' free examination the Electrical Maintenance and Repair Library. If satisfactory I will send you \$2.50 in 10 days and \$3.00 monthly until the price of \$17.50 is paid. If not wanted I will return books postpaid.

Name.....

Home Address.....

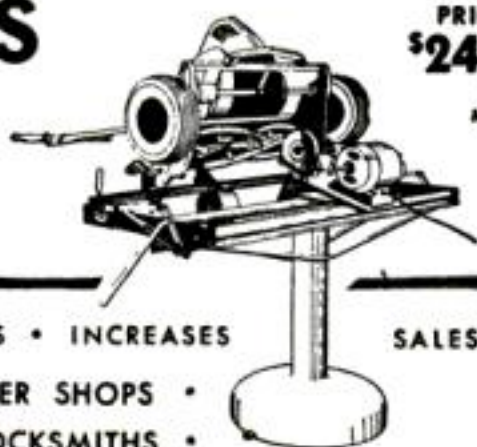
City.....Zone.....State.....

Company.....

Position..... PSM-3-49

MODERN LAWN MOWER SHARPENER

PROFITS and SPEED



PRICE
\$241⁵⁰
LESS
MOTOR

INCREASES PROFITS • INCREASES SALES!
FOR LAWN MOWER SHOPS •
FIXIT SHOPS • LOCKSMITHS •
HARDWARE STORES • GOLF COURSES • SCHOOLS
PARKS • PLAYGROUNDS • INSTITUTIONS •
CEMETERIES • AND ALERT INDIVIDUALS!

Sharpens All Reel Type Mowers • Hand, Power or
Gang • 10 to 20 Minutes • No Dismantling
No Extra Attachments Needed

All reel type mowers, from 5-inch edgers to 36-inch power mowers, are quickly sharpened to extreme ends of both left and right twist reel blades. Handle, wheels, roller and motor remain in place when sharpening is in process. Bed knife is sharpened in same brackets that hold mower in grinding position. No extra attachments required. One lever puts mower or bed knife in grinding position. 100% steel construction. Grinding head rides on five ball bearing races. Small, compact, easy to operate. Sharpens wood chisels, joiner knives and planer blades without extra attachments.

ORDER
NOW
Immediate
Delivery

Skate Sharpener Attachment Available
1/3 H.P., 60-Cycle G.E. Motors Now Available \$21.50
Send For Free Bulletin No. 11B

MODERN MFG. CO. 160 N. FAIR OAKS AVE
PASADENA 1, CALIFORNIA

MAKE YOUR OWN!

WITH

Griffin READYCUT LEATHER PROJECTS

Over 100 KITS in every kind of Tooling and Carving Leather, accurately cut, all parts included. Only Top Grade Leathers used. You do the choosing. You do the tooling, carving, stamping, the punching and assembling.



SEND FOR
COMPLETE CATALOG
Please send
10c to cover
mailing.

SINCE 1924

OUT OF THE WEST, THE HOME OF LEATHER CARVING

Griffin Craft Supplies

5515-B GROVE STREET
OAKLAND 9, CALIFORNIA

EVERYTHING FOR THE LEATHER WORKER

Largest, most complete stock
of Leathercraft Tools and Acces-
sories in U. S. A.



HIDES AND
SKINS of Craft
Leathers of every
kind if you prefer
to cut your own.

Now She Shops "Cash And Carry"

Without Painful Backache

When disorder of kidney function permits poisonous matter to remain in your blood, it may cause nagging backache, rheumatic pains, leg pains, loss of pep and energy, getting up nights, swelling, puffiness under the eyes, headaches and dizziness. Frequent or scanty passages with smarting and burning sometimes shows there is something wrong with your kidneys or bladder.

Don't wait! Ask your druggist for Doan's Pills, a stimulant diuretic, used successfully by millions for over 50 years. Doan's give happy relief and will help the 15 miles of kidney tubes flush out poisonous waste from your blood. Get Doan's Pills.



CORRESPONDENCE COURSES IN RADIO and ELECTRICAL ENGINEERING

Tuition
\$25

ELECTRICAL ENGINEERING. Get good grasp of wide electrical field. Modern. Very understandable. Theory made easy. **RADIO ENGINEERING.** Extra fine course in radio, public address, photo-electric work. Trains you to be super-service man, real vacuum tube technician. Tuition ONLY \$25, either course. Deferred payment plan. Servicemen needed badly.

FREE Electronic Kit given to students enrolling by Apr. 15. Write for free school catalog, student magazine, etc. LINCOLN ENGINEERING SCHOOL, Box 931, S-123, Lincoln, Nebr.

Save on CIGARETTES

Chesterfield, Lucky Strike, Old Gold, Camel, Philip Morris, Tareyton, Raleigh, Kools, etc. All postage and insurance

\$1.58 Carton of
10 packs

PAID to any point in the U. S. on 5 cartons or more. Send remittance with order. Write for complete list.

JOE SMITH SALES COMPANY

P. O. Box 1066

Department POS

Joplin, Mo.

TruSpeed BOAT SPEEDOMETER



Accurate and practical, at a price you can afford. Polished aluminum case is 5 3/4" wide x 5 3/16" high. Requires only 1/2" hole through dash. Easy-to-read dial is full 3" diameter. Simply installed. Two models: 1 to 35 m.p.h. - \$10.95 and 10 to 50 m.p.h. - \$12.95 postpaid in U.S.A. complete with all connections. A guaranteed instrument. See your dealer or write direct.

MUSKEGON OUTBOARD SPECIALTIES CO., Box 426, Muskegon, Mich.

WRITTEN 1 YEAR GUARANTEE

**LOWEST
PRICE
EVER!**

17 JEWEL 2 PUSH CHRONOGRAPH

ORIGINALLY

\$71.50 **\$21.95**

**Our Price
ONLY**

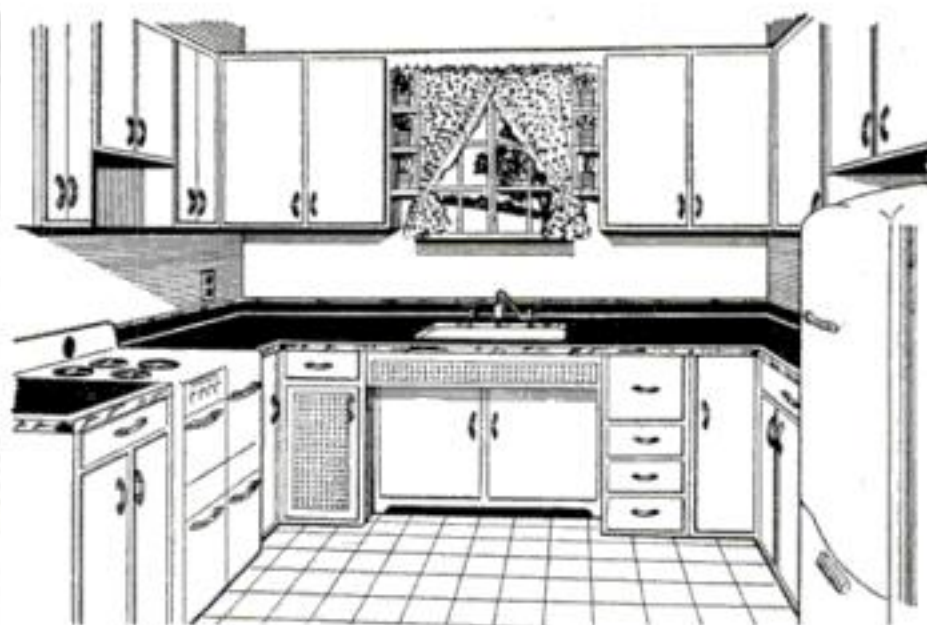
plus tax

- Wristwatch • Stop-Watch
- Telemeter • Tachometer

Precision 4 in 1 Timepiece. Incablock shock resistant feature. Sweep second hand. Anti-magnetic. Radium dial. Stainless steel back. Unbreakable crystal. Perfect for physicians, scientists, technicians, engineers, aviators, photographers, broadcasters, navigators, sportsmen, service men, etc. Order now while they last at this record breaking low price. Send only \$1 down payment with order. Pay balance to postman on arrival plus postage. Or we pay postage if you enclose \$21.95 plus \$2.20 tax.

Money back in 5 days if not delighted. Order now!

MARYLAND DISTRIBUTORS, Dept. 6
501 E. Baltimore St. Baltimore 2, Md.



MODERNIZE YOUR OWN KITCHEN EASILY—INEXPENSIVELY

with **EASI-BILD*** "Build It Yourself" cabinets

The **Easi-Bild Pattern** Method takes the mystery out of making modern, professional looking base and wall cabinets. Tells what materials to buy...when and where to use each...specifies the right Casco Glue.

Includes complete assembly illustrations and step-by-step directions. **FULL SIZE CABINET CONSTRUCTION PATTERNS** make *entire* kitchen modernization an easy job!

*Copr. 1949, Easi-Bild Pattern Co.

Follow These Directions.

Solve All Your Gluing Problems:



For boats, outdoor furniture, sports equipment—joints that must withstand outdoor exposure—**CASCOPHEN** (Resorcin Resin Glue). The first completely durable glue available to home-craftsmen.



For furniture, toys, heavy-duty home repairs—use **CASCAMITE** (Urea Resin Glue) where you want a light-colored or mold-proof glue line. Use **CASCO** (Casein Glue) for loose-fitting joints, general heavy-duty jobs. Both easily mixed in cold water.



SEND COUPON FOR CABINET PATTERN TO:

Casco Pattern Dept. PS-39

P. O. Box 215, Pleasantville, N. Y.

Enclosed is \$.....for material checked below:

() Kitchen Wall and Base Cabinet, Pattern No. 201—\$1.00.

() 32-page Pattern Book illustrating 94 pattern projects—20¢.

Name _____

Address _____

City _____ Zone _____ State _____

THE BORDEN CO. • CHEMICAL DIVISION
Makers of Casco Glues



Big Bargain!

FOR AMATEUR PHOTOGRAPHERS
\$750 RANGE FINDER

Gets your camera shots in sharp focus for perfect pictures every time. Fast, easy to use, military type accuracy. With clip for attaching to your camera. Regularly \$7.50. At Central during our 50th Anniversary Sale, only \$3.95 (plus postage). 10-Day Money-Back Trial.

\$3.95

FREE BARGAIN BOOK

Hundreds of sensation photographic bargains, new and used. Write for your free copy today.

CENTRAL CAMERA CO.

230 S. WABASH, CHICAGO 4 • Established 1899

RUPTURE



RELIEF...OR YOUR MONEY BACK

A simple... sturdy truss support built nature's way by old surgical appliance manufacturer. You risk nothing... relief or your money back. Send now for free booklet.

WEB TRUSS CO. Dept. S-31 Hagerstown, Md.

WAR SURPLUS CLOTHING



EXTRA-HEAVY CHINO KHAKI

SHIRTS-PANTS

\$2.59 Add 10c per item postage **\$3.69**

sizes 14 to 17 sizes 28 to 42 New heavy, sanforized Army Type Chino. Custom quality tailoring. Shirt double stitched: 2 pockets. Pants: 8.2 weight have 2 side, 2 back and 1 watch pocket. Pants and shirt only \$5.95. Ideal for route men, filling station, general work. Order now! Add 15¢ per uniform postage. Or send no money, pay postman on arrival plus postage. Money Back Guarantee.

Baltimore Mail Order House, Dept. 9, 607 N. Eutaw St., Baltimore, Md.

SAVE UP TO 60%

Army Surplus shoes, boots, clothing, other supplies. Write for FREE bargain catalog.

For Cabinet Finishing *use* PLASTIC WOOD



in your
HOME WORKSHOP!

If you'd like a satiny smooth, professional finish on your next cabinet job—use Plastic Wood! It's an ideal filler for cracks or rough grains, dries tight and hard, sands to a swell finish and takes paint, lacquer or varnish perfectly. Here's an extra hint—knot holes or gouges just disappear when this handiest filler is used! *Handles like putty—hardens into wood!*

... dozens of other uses

FOR FILLING ...

- Countersunk screws
- Chipped furniture
- Nail and screw holes

FOR REPAIRING ...

- Loose casters
- Broken balusters
- Broken furniture

- You'll want Plastic Wood SOLVENT, too. Get both at one time. It is made especially to control the consistency of Plastic Wood ... useful also in removing dried Plastic Wood from tools and fingers.

T. M. Reg. U. S. Pat. Off.

At all Hardware,
Paint and 10c Stores



PLASTIC WOOD

Tube or Can

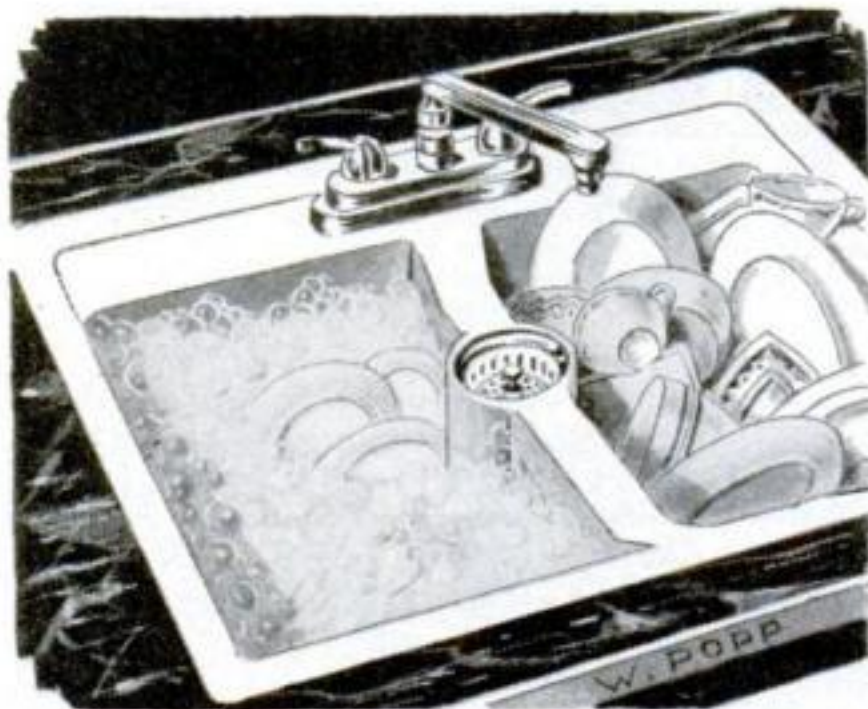
A CELLULOSE FIBRE FILLER

I'd like to see them make...

Everybody has his own pet idea of some gadget he would like to see in general use. What is YOURS? Popular Science will pay \$5.00 for each one published. Use government postcards only. Contributions cannot be acknowledged or returned.



A buffer run by a flexible shaft attached to a car's engine. It could be driven off the fan belt. Then you could park your car anywhere to polish it by power.—N. R. Rollo, Kansas City, Missouri.



Auxiliary drains on double sinks. When both sinks were full of soaking and draining dishes, you could pour leftover coffee or other waste liquids in the extra drain.—Mrs. Jerry V. De Camp, Palo Alto, Calif.

Here's Why

WHIZZER

Is America's Leading
Bike Motor

AIR COOLED MOTOR

4-cycle design, 2½
rugged h.p. Auto-
type carburetor gives
125 miles per gallon.
Speeds to 35 m.p.h.

TWIST-GRIP CONTROLS

Motorcycle type, for
safe, easy control
under all operating
conditions.

STREAMLINED GAS TANK

Holds 5 quarts. Made
of heavy gauge steel,
baked enamel finish.

STEEL CABLE BELT DRIVE

Notched V-belts are
reinforced with 5
high-flex steel cables,
give extra efficient
power transmission.

RUBBER MOTOR MOUNTS

Special three-point
suspension, mounted
in rubber, soaks up
vibration.

HOT-SPARK IGNITION

High tension mag-
neto, coil and con-
denser for quick
starting. No battery
required.

ALL-CHROME TRIM

Motor mounts, belt
guard and exhaust
pipe chrome plated
for extra beauty,
longer life.



FOR NEAREST WHIZZER DEALER, CALL
WESTERN UNION, ASK FOR OPERATOR 25

HEAVY-DUTY BIKE STAND

Adjustable, extra
heavy stand supplied
with every motor.

COMPLETE WITH ALL
NECESSARY ATTACHMENTS

\$109⁹⁷

Federal Tax Included,
F.O.B. Pontiac, Mich.

Fits any
man's balloon tire bike

PRECISION ENGINEERED

Cylinder micro-honed
to 5/10,000" toler-
ance. Drop forged
crankshaft, camshaft,
connecting rod.

FREE LITERATURE!

WHIZZER MOTOR COMPANY
350 South Sanford,
PONTIAC, MICHIGAN

Send me literature on the Whizzer Bike Motor

NAME _____

STREET _____

CITY _____ STATE _____

EASIER reading in any position! *New* STANLEY VERTICAL READING PULL-PUSH RULES

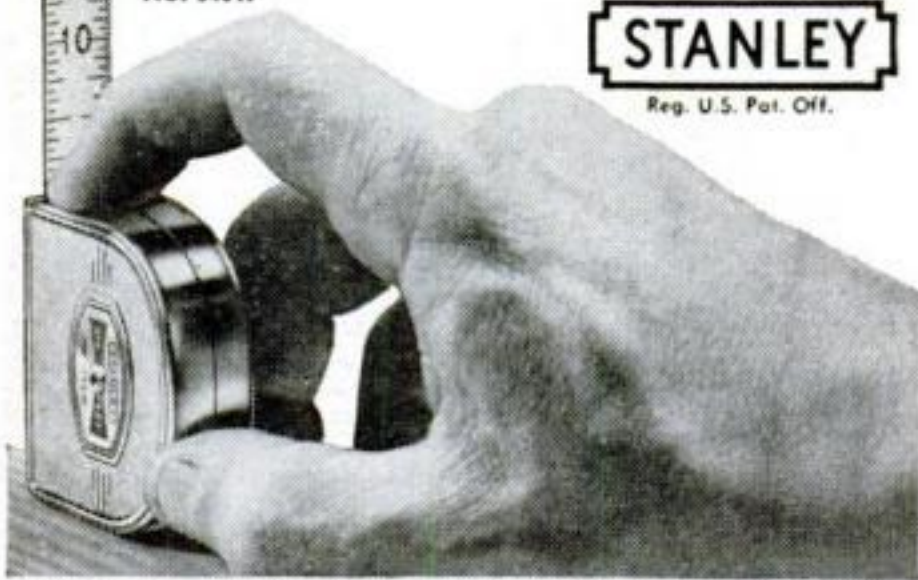
Up, down, inside, outside . . . in any position this new rule saves time, irritation and mistakes. The numbers are always straight ahead . . . no head-twisting. Easy reading even in poor light. Broken blades replaced in a few minutes at small cost. Available with white blade or nickel plated blade—6 ft. or 8 ft. lengths. Useful more places, more years . . . one of the ways Stanley gives you so much more tool for the money.

Let this coupon bring you these two books One is FREE! The other, the latest edition of a famous textbook for the home workshop, clothbound, fully illustrated, just \$1.00.

THE TOOL BOX OF THE WORLD

NO. 346W

STANLEY
Reg. U.S. Pat. Off.



HARDWARE, HAND TOOLS, ELECTRIC TOOLS, STEEL STRAPPING

Stanley Tools, 229 Elm St.
New Britain, Conn.

Please send by return mail:

- ☐ FREE: "The Joy of Accomplishment".
- ☐ 188-page book: "How to Work with Tools and Wood". \$1.00 enclosed.

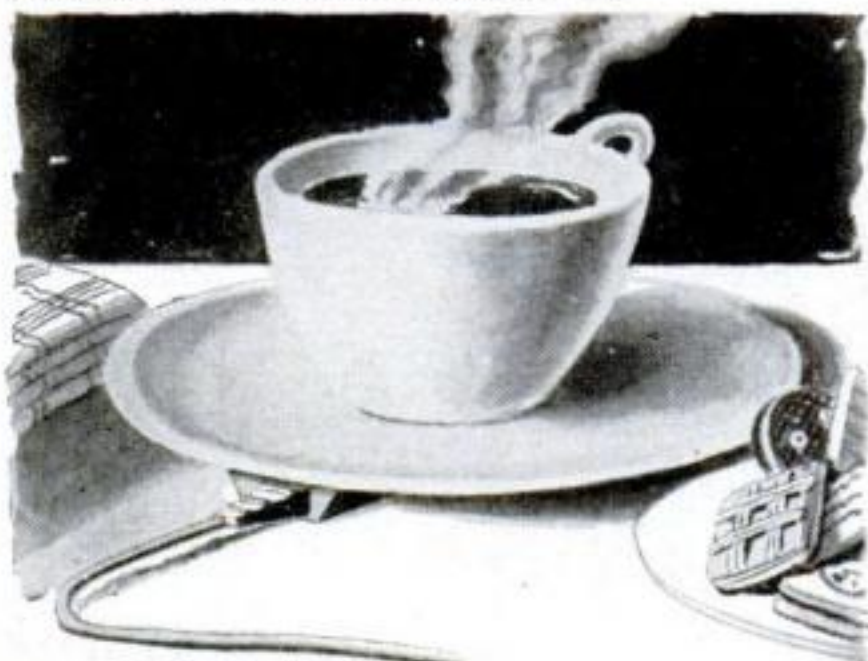
(In Canada: Send order to Stanley Tool Co. of Canada, Ltd., Roxton Pond, Quebec.)

Name.....

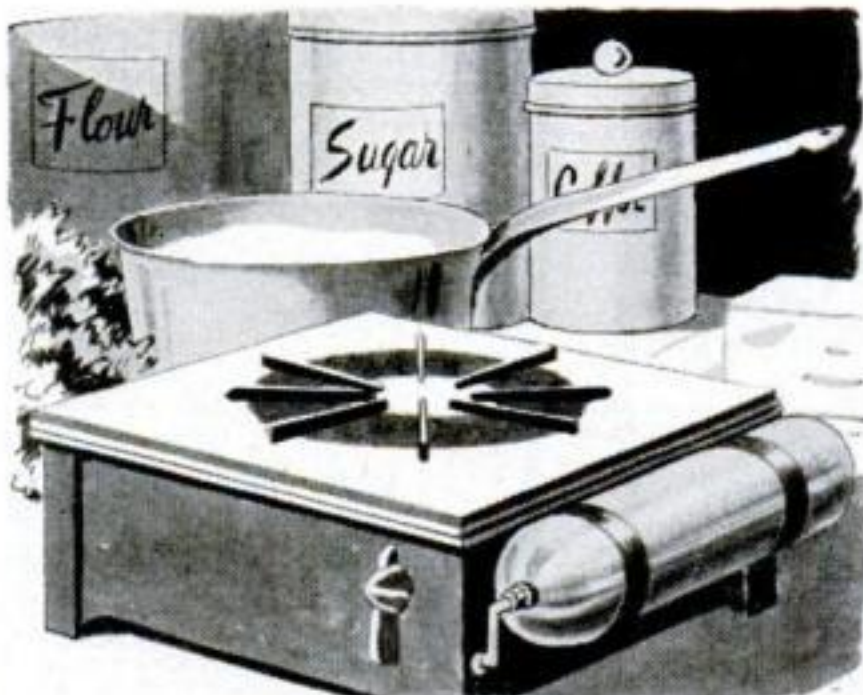
Address.....

City.....State.....

I'd like to see them make . . .



Electrically heated coffee cups. Contacts in cup and saucer would operate it only when the cup was on the saucer. They'd have to be designed so that saucer slops wouldn't short them.
—Leonti Thompson, Manhattan, N. Y.



A self-contained, bottle-gas burner. It would be a stand-by unit and even if it had only one burner, you still could have hot food when a power or gas failure knocked out the regular stove.—John Wilson, Chicago.



A sifter that would measure the amount of flour that passed through it. You could just fill it with flour and a gauge on one side would register the amount of flour that had been sifted.
—Gene Zevely, Moro, Ore.

Choose Your "22" From This Great Line-up



FIRST IN THE FIELD



Lightning fast, lightweight automatics... accurate, well balanced repeaters (*both* clip and tubular magazine models)... sturdy, dependable "single shots". Take your pick and *pick a Savage or Stevens* "22" rifle for highest quality — greatest value. See these models at your dealer's — write for free catalog.

SAVAGE ARMS CORPORATION
Firearms Division Chicopee Falls, Mass.



STEVENS .22 Rifles — First in value

Model 86 — .22 cal. Bolt Action Tubular Magazine Repeating Rifle. Magazine holds fifteen .22 long rifle; seventeen .22 long or twenty-one .22 short cartridges. Military style stock with pistol grip.

Model 84 — .22 cal. Bolt Action, Clip Magazine Repeating Rifle. Detachable clip holds five .22 long rifle; .22 long or .22 short cartridges. Self-cocking, bolt action. Independent safety.

Model 15 — .22 cal. Bolt Action, Single Shot Rifle. Chambered for .22 long rifle; .22 long or .22 short cartridges. The lowest priced lightweight "22" in the field.

Model 87 — Semi-Automatic .22 cal. Rifle. Shoots 15 shots as fast as trigger can be pulled. Also, instantly adjustable as single shot or bolt action repeater, shooting .22 long rifle; .22 long or .22 short cartridges.

Stevens Models 86S - 84S - 87S; same as above with No. 150 Micro Peep Sight with Hooded Front Sight illustrated above.

SAVAGE .22 Rifles — First in quality

Model 6 — .22 cal. Auto-Loading Rifle — shoots fifteen long rifle cartridges as fast as you can pull the trigger. Also, instantly adjustable as bolt action repeater; shooting .22 long rifle; .22 long or .22 short cartridges.

Model 5 — .22 cal. Bolt Action Tubular Magazine Repeating Rifle. Magazine capacity — fifteen .22 long rifle; seventeen .22 long or twenty-one .22 short cartridges.

Model 4 — .22 cal. Bolt Action 5-shot Clip Magazine Rifle. Chambered for .22 long rifle; .22 long or .22 short cartridges. Stock and forestock of walnut.

Model 3 — .22 cal. Single Shot Bolt Action Rifle. Shoots .22 long rifle; .22 long or .22 short cartridges, regular or high speed. Positive safety. Walnut stock and forestock.

Savage Models 6S - 5S - 4S - 3S; same with No. 150 Micro Peep Sight with Hooded Front Sight illustrated and described above.

MAN-SIZED STOCKS

Stocks and forestocks of Savage and Stevens "22" rifles are full size, attractively finished, and properly proportioned for steady holding.



No. 150

MICRO PEEP SIGHT with **HOODED FRONT SIGHT**
Micrometer elevation and windage adjustment. Precision built. Helps build top marksmanship.

TENITE

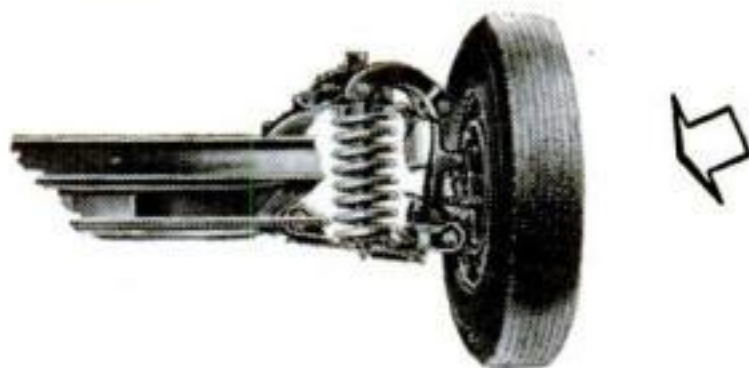
The beautiful, durable, service-proven gunstock material—permits custom stock features and appearance on guns priced with the lowest. Now available on the Stevens model 87 (illus. at left) as well as other Stevens rifles and shotguns.

Facts about the NEW FORD "FEEL"

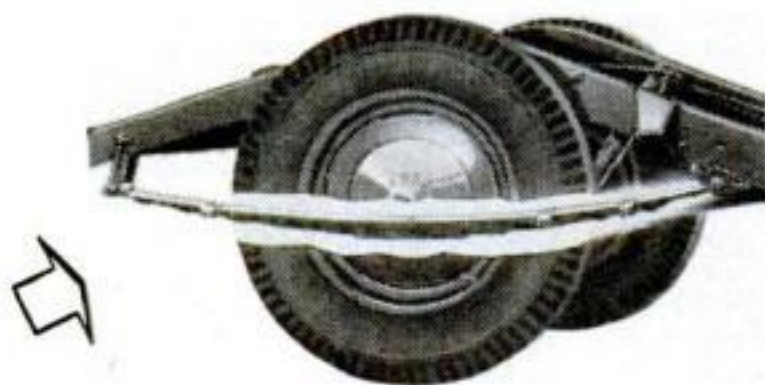


One of the most important things contributing to the New Ford "Feel" is the solid roadability and exceptional comfort of the "Mid Ship" Ride. Seats are scientifically positioned between the wheels to cradle the passengers luxuriously.

In addition, a completely new suspension system is part of the Ford "Feel" of cradled smoothness. The "Para-Flex" Rear Springs are extra-long semi-elliptic type. Impregnated inserts between tips of spring leaves, together with concentrated pressure-type rubber bushings at shackles and brackets, eliminate need for lubrication.



Add the new low center of gravity and the 59% more rigid body-chassis combination and you have, as a result, Ford's famed "Mid Ship" Ride . . . an outstanding part of the new Ford "Feel" everyone is talking about.



At the front are "Hydra-Coil" Springs in a swinging link independent suspension system. Double-acting hydraulic aircraft-type shock absorbers are mounted inside the coil springs. They can be easily removed and replaced without even jacking up the car. You'll feel the difference in the ride.

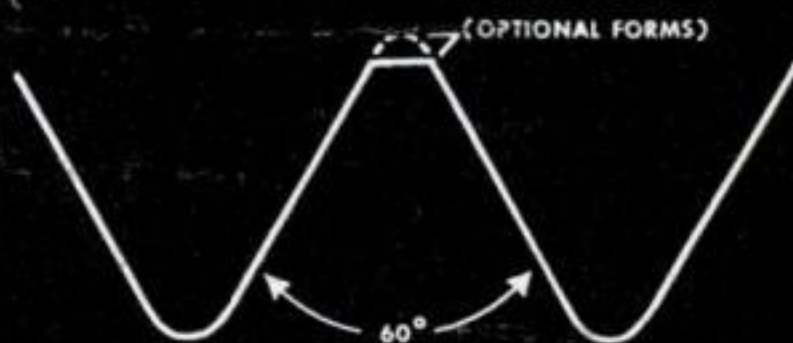
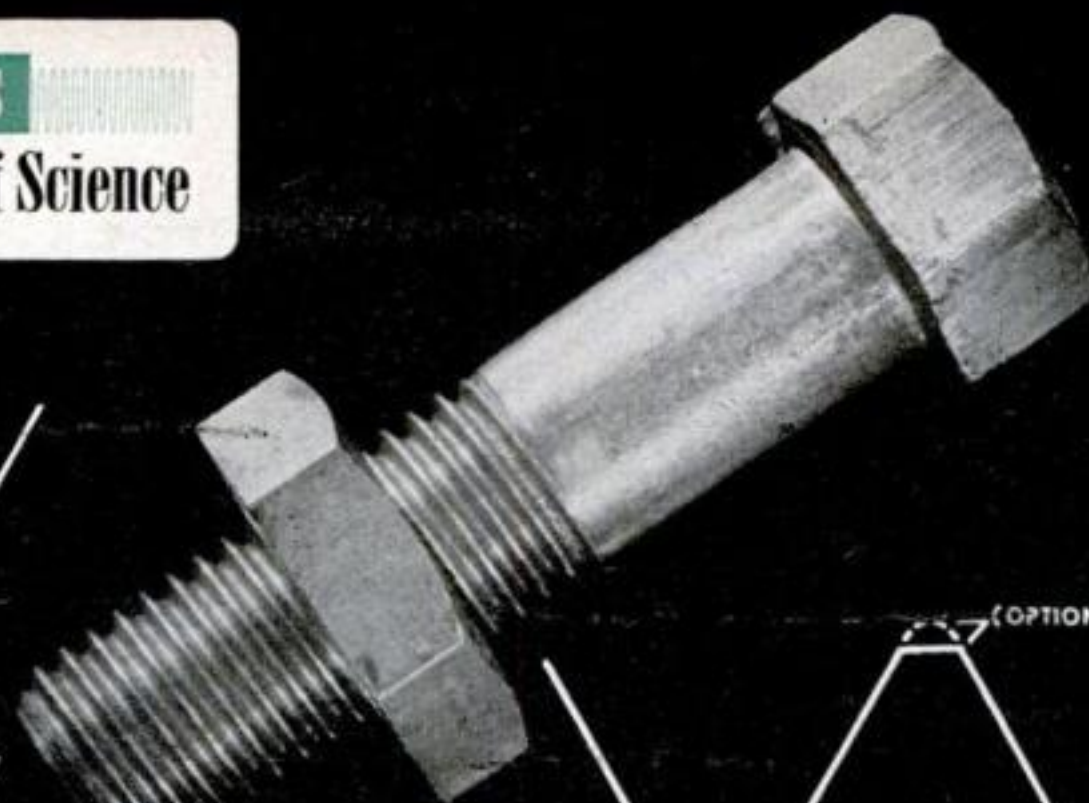
There's a ^{NEW} Ford in your future



OLD U.S. BOLT THREAD



OLD BRITISH BOLT THREAD



NEW U.S. AND BRITISH BOLT THREADS

Nuts, Bolts & People

NUTS and bolts you know as little things that put big things together. Actually, our whole industrial civilization hangs by a thread—a screw thread.

Ever since the Civil War there has been growing and costly confusion because of the differences in two systems of screw-thread design. The Whitworth thread, Britain's standard since 1845, has a 55-degree angle; the Sellers thread, America's standard since 1864, uses a 60-degree angle.

The differences in shape of thread, pitch (number of threads to inch), and tolerances have, in effect, hung a mechanical curtain between these greatest industrial nations. Two nuts might look alike. But one you could spin on a bolt with your fingers. The other you might strong-arm with a wrench, making a weak joint or ruining the threads. For the nuts, even though the same "size," were as different as Detroit and London—and have skinned knuckles in both places.

The situation became dangerous in World War II. The differences in the two systems forced the manufacture, shipment, stockpiling, and supply to the armed forces of *two* complete sets of much equipment otherwise practically identical. This meant that a British machine gun, made in Connecticut,

might be out of action although repair parts, threaded differently, might be available in a nearby American unit.

Now comes news that the long and costly battle of the threads is to end. Beginning, understandably, with military equipment, a new "international" design will match up the nuts and bolts of Britain, Canada, and the United States.

To mechanics and engineers, the "Unified Screw Thread Standard" means that threaded machine parts of these nations will be interchangeable. To the rest of the world, it means that the new thread literally bolts together the biggest collective production capacity in the world. To diplomats, the "Unified Screw Thread Standard" becomes a tangible example of compromise and agreement between nations that they might well follow.

They might begin with a "Unified Standard of Meanings." There are too many words, like "freedom," with differing threads of thought. Words are only the nuts and bolts of ideas. But the world needs unified standards to make the interchangeable parts of peace.

Perry Githens

MARCH 1949 103

SMOOTH is the word for
the man with **P.A.***



P. means **P**ipe **A**ppeal
A.* means **P**rince **A**lbert

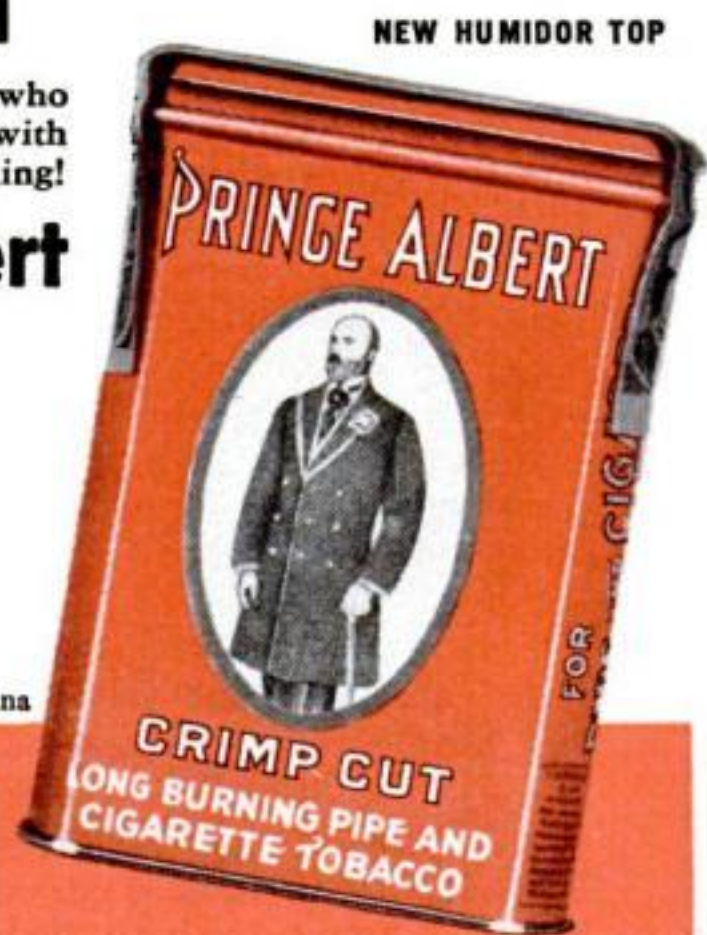
● Get Prince Albert today—and see for yourself why it's known as the National Joy Smoke. P.A. is really rich tasting—mild, and tongue-easy. That choice crimp cut tobacco is specially treated to insure against tongue bite. Get Prince Albert for real smoking joy and comfort!

R. J. Reynolds Tobacco Company, Winston-Salem, North Carolina



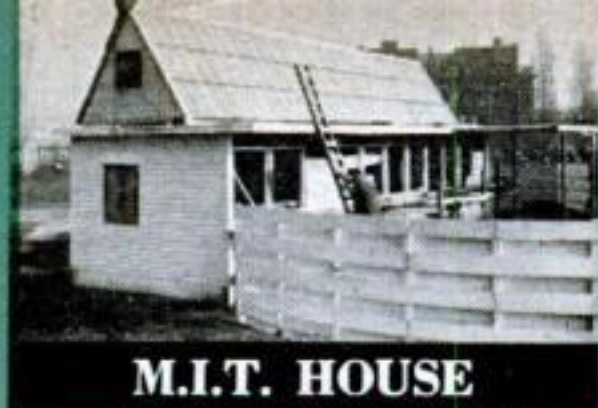
*"P.A. ROLLS UP SO SMOOTH—MAKES
A GRAND-TASTING CIGARETTE!"*

THE NATIONAL JOY SMOKE

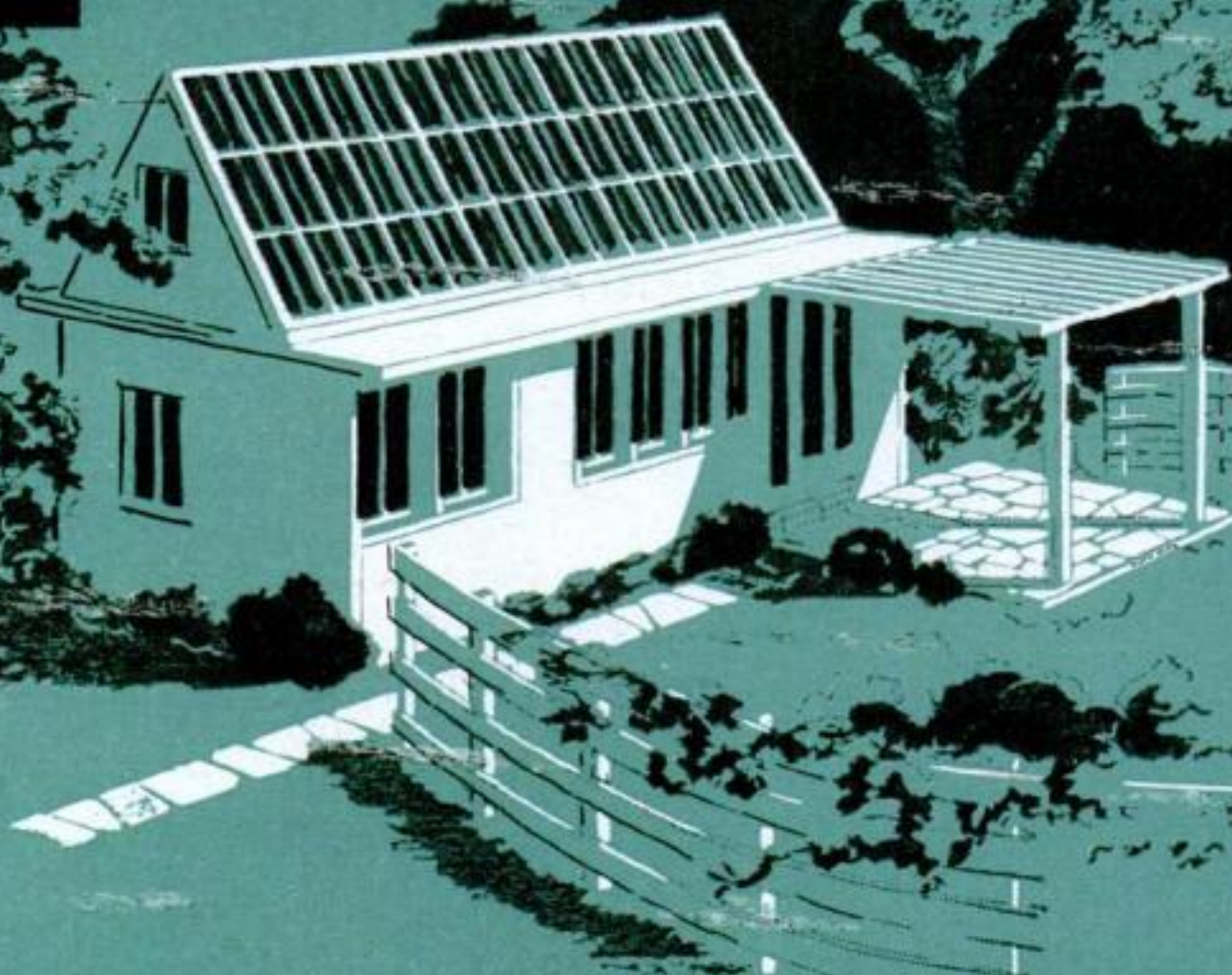




Inside Look at Jet Power . . . Here's what gives the big Martin XB-48 multijet bomber a speed close to 500 m.p.h. Above, cowlings are raised for inspection on two of the plane's General Electric, Allison-made J-35 gas-turbine engines. Each produces 4,000 pounds of thrust. Six of these power plants—three in each wing—develop a maximum power greater than that used by two huge electric railroad locomotives each pulling a string of 125 freight cars. The largest multijet bomber of conventional design ever built for the Air Force, the XB-48 has a tactical radius of over 800 miles. It carries a crew of three and has a bomb capacity of more than 10 tons.



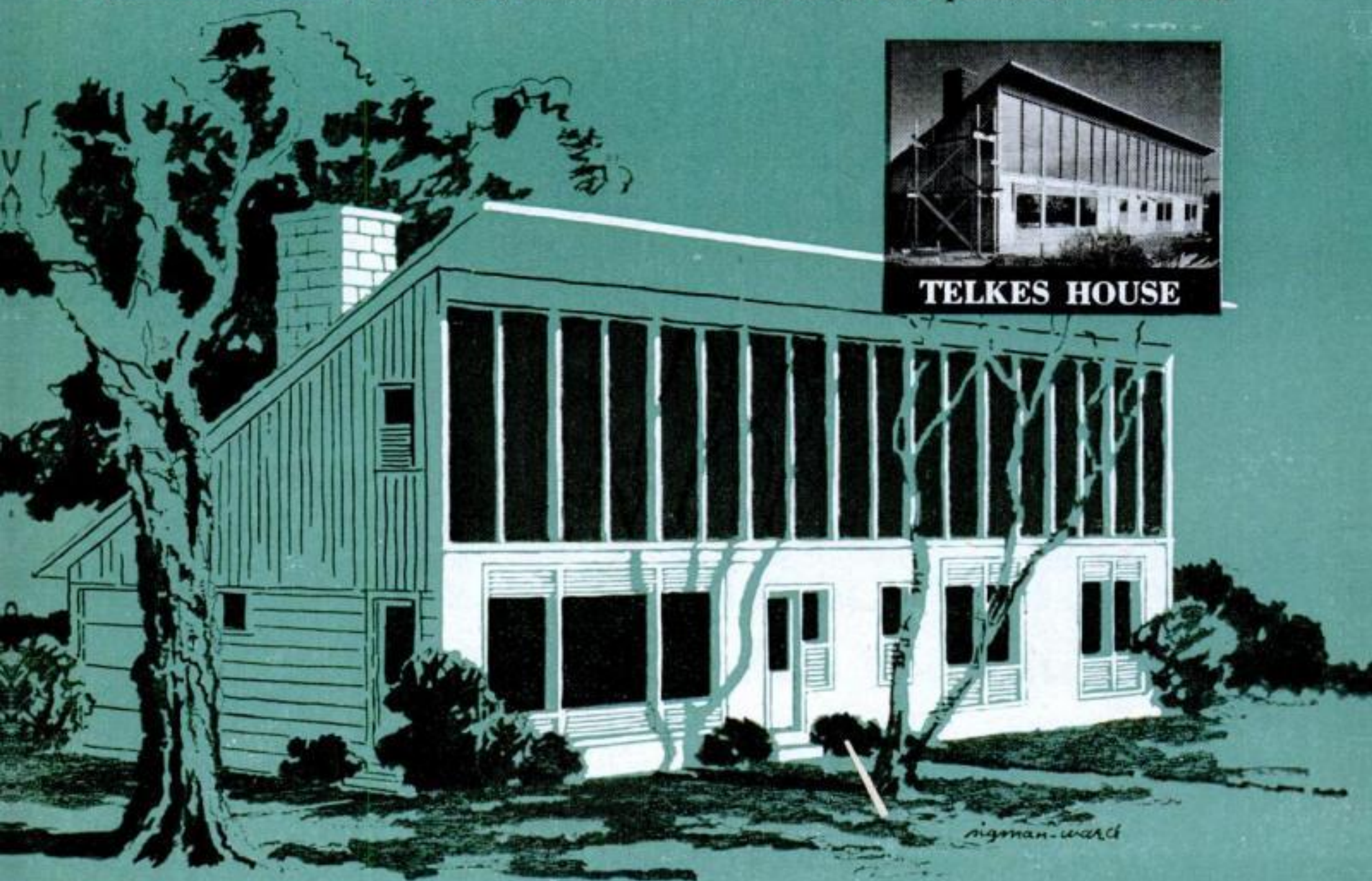
M.I.T. HOUSE



Experimental house in Cambridge, Mass., counts on sun for 90 to 95 percent of winter heat.



TELKES HOUSE



Designed by architect Eleanor Raymond, this house at Dover, Mass., is entirely sun-heated.

Sun Furnace

Cover drawing
by Ray Pioch



In Your Attic

By Hartley E. Howe

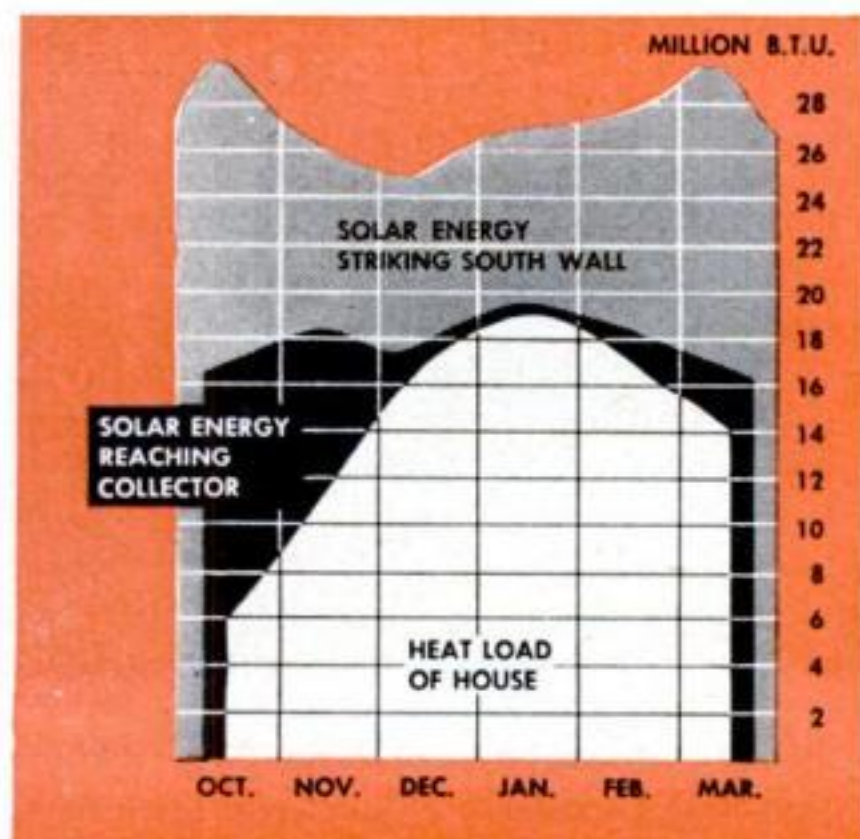
Two houses near chilly Boston may hold the key to economies in home heating and world's fuel supply.

EVERY day, the equivalent of almost two tons of coal per acre falls on the United States. It arrives as visible and invisible light—20,000,000 kilocalories of solar energy. Most of it is wasted.

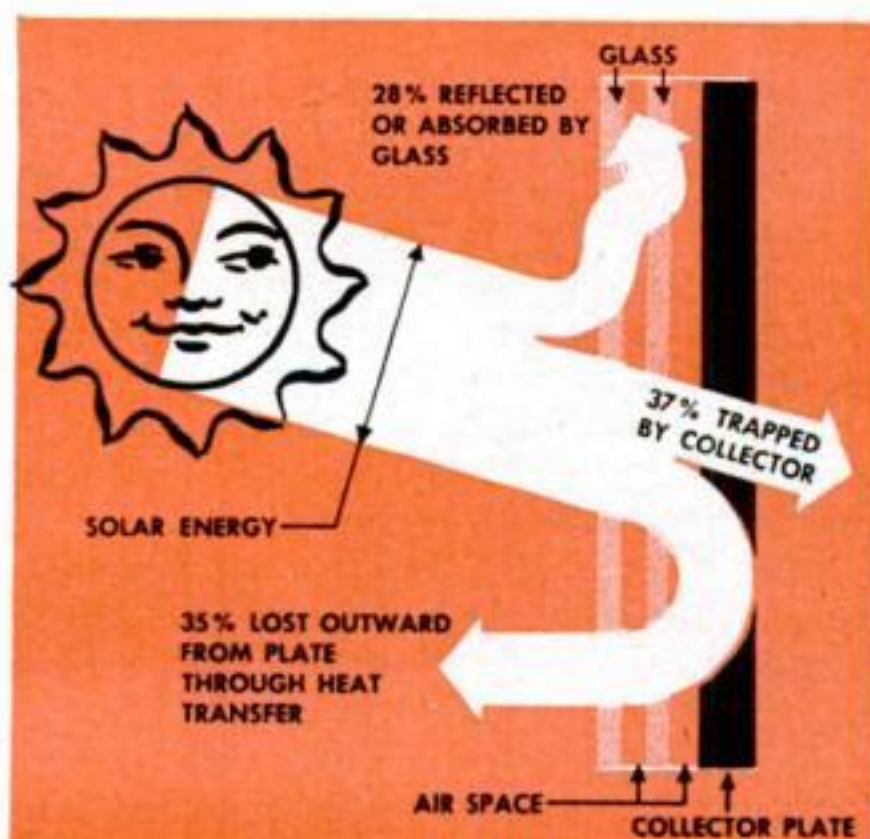
We have reached a point where we need so much energy that we can see the eventual end of our supply of coal and oil. *One third of all our energy goes just to keep us warm.* That's why the two houses on the opposite page may well be two of the most important houses in the world today.

People have been living in these houses this winter without conventional furnaces—in the chilly neighborhood of Boston. They are trying to find out if the sun itself can keep them warm. Do the houses work? We don't know yet for sure. But scientists are banking on it—and success would stretch our fuel supplies for centuries.

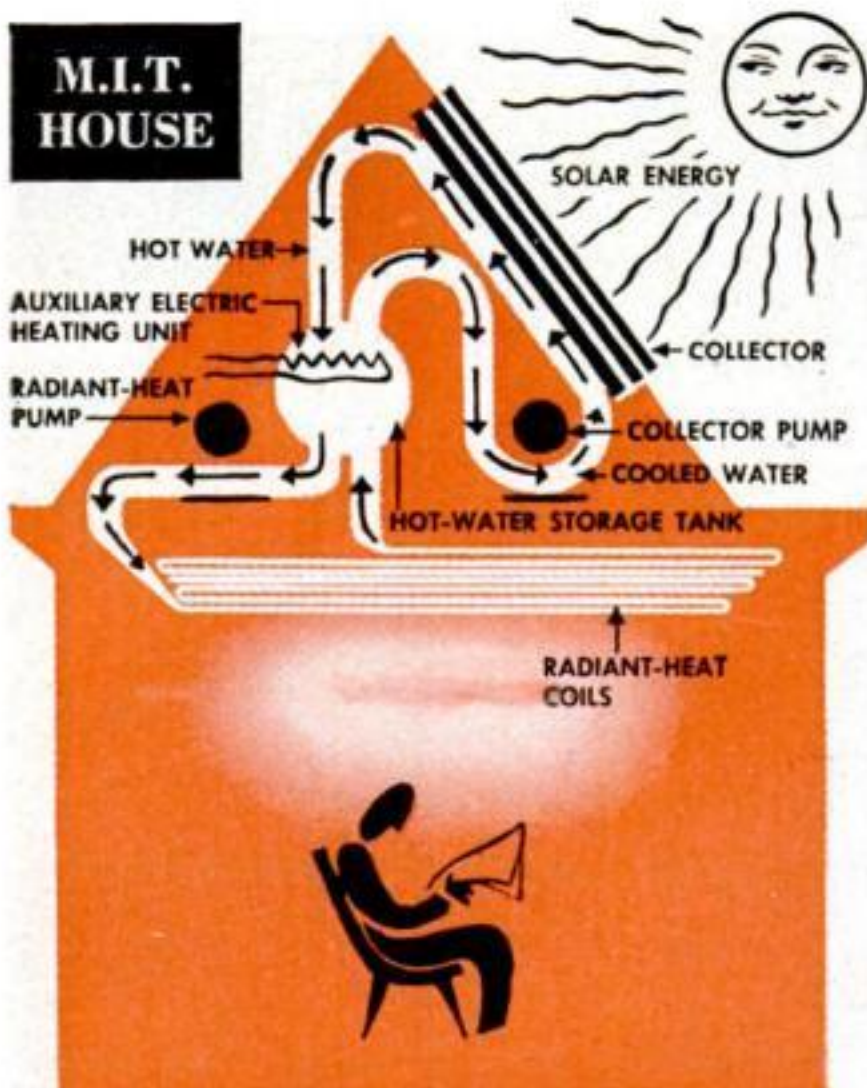
To have a sun-heated house, you must solve three problems. First, find a way to trap the sun's heat—or a sizable amount. Second—far more difficult—find a way to



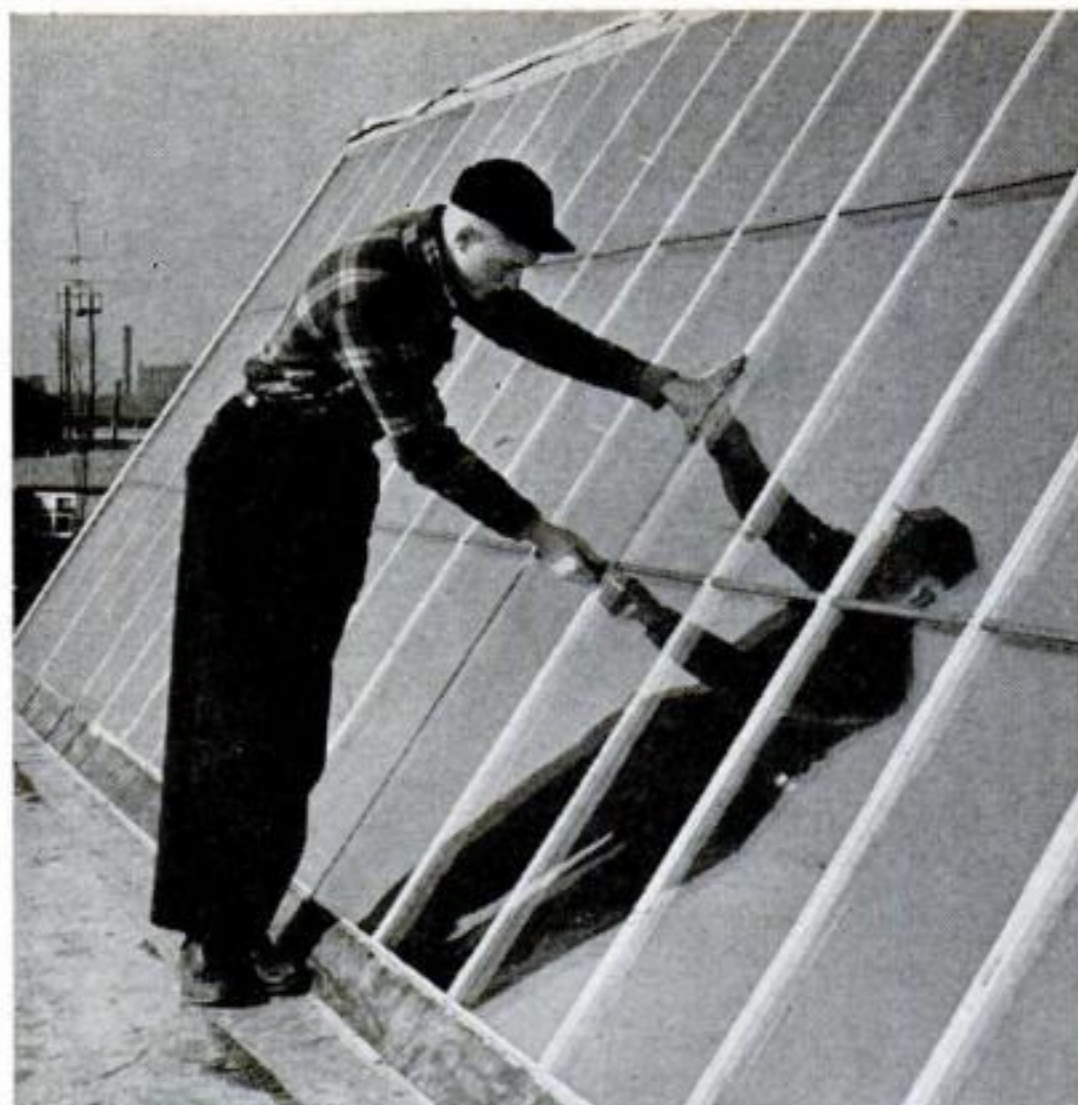
Graph shows margin between average monthly heat demands of Boston house requiring 100 million B.T.U. a year and solar energy trapped by vertical 800-sq.-ft. collector, facing south.



M. I. T. heat collector has two sheets of glass in front of black metal plate. It holds 37 percent of sun's heat for house. Loss outward is included in house heat load in graph at left.



M. I. T. house uses water to gather heat from collector and store it in tank. Electric heater switches on when the house cools below 65° F. Pump circulates water through radiant panels.



Panels of M. I. T. roof collector are set at an angle to get maximum amount of mid-winter sun. Double panes are mounted in rubber. Collector is designed to simplify manufacture.

store peak heat for use at night and in bad weather. Third, do these things with apparatus not too complicated, too bulky, or too expensive. The designers of these two houses think they have all three answers.

Although entirely separate projects, both houses stem from the pioneering Solar Energy Research Project at the Massachusetts Institute of Technology. Here for the past 12 years an endowment by Dr. Godfrey L. Cabot has enabled scientists to explore ways in which man can better use solar energy. One of the new houses was built by the project itself as its latest experiment. The other was privately financed, by Miss Amelia Peabody of Boston, for the sun heating system developed by Dr. Maria Telkes of the M.I.T. faculty, long with the Solar Project.

In both houses, the trap that catches solar energy is the collector devised by H. C. Hottel and B. B. Woertz of M.I.T. This makes use of a fact familiar to every greenhouse owner: you can catch sunlight under glass. The very short energy waves from the sun go through glass comparatively easily and heat what they hit. The long heat waves from the hot object, however, do not penetrate glass easily and are trapped behind it.

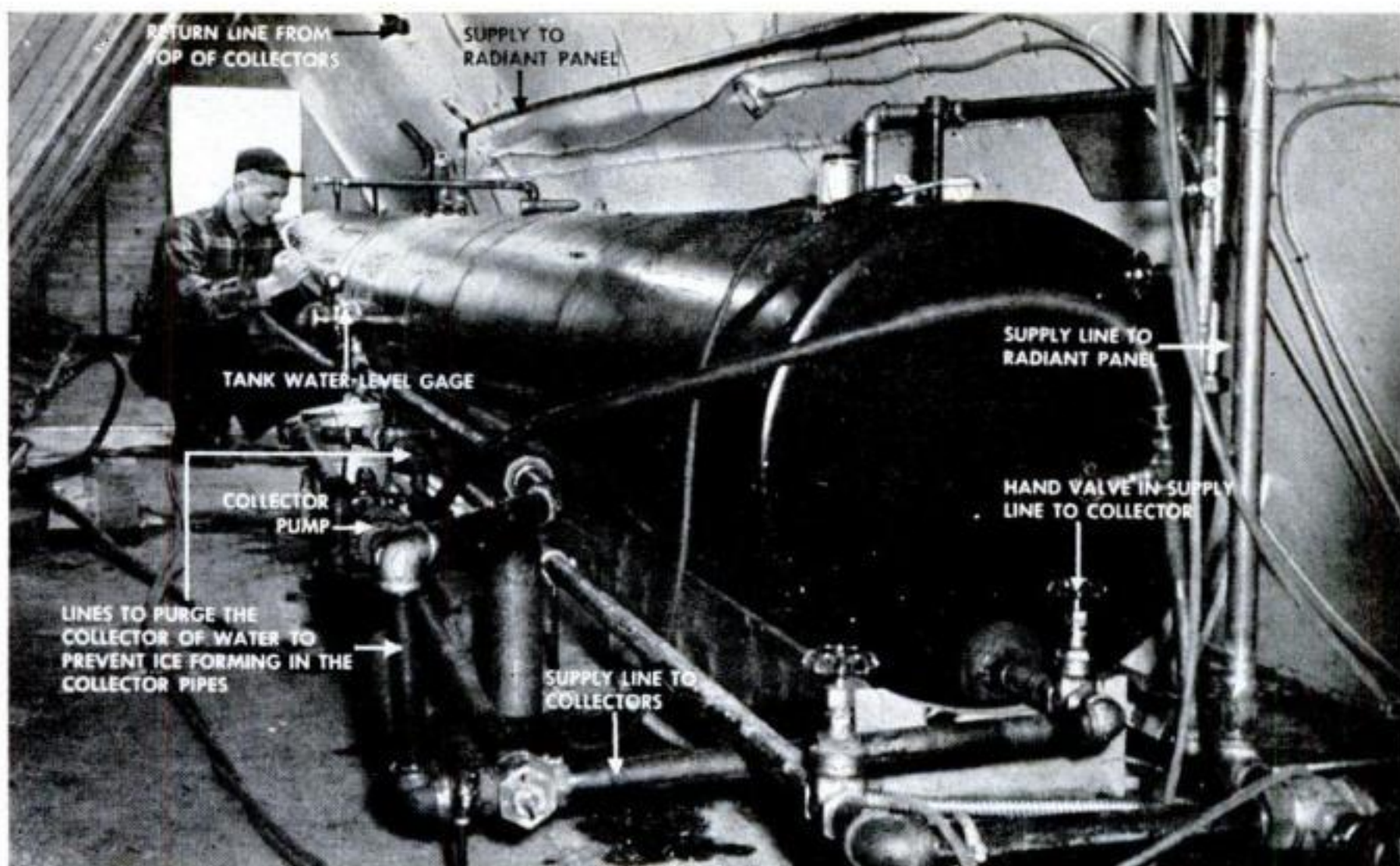
In the Hottel collector, two 7/32-inch

glass plates, with a 1/2-inch air space between them, cover a sheet of black-painted metal. About 37 percent of the energy that strikes the outer surface is trapped by the sheet.

If left in the metal plate, much of this energy will be lost outward during the night. This is why the widely known "solar" house with its big south windows must depend on a furnace for its main heat source; it heats up well on sunny days, but rapidly cools as it loses heat outward after dark. A true sun-heated house must store the heat—not only for a night, but for days at a time during bad weather. What is needed is the equivalent of a storage battery; something that will soak up the heat on bright, sunny days, and hold it for later use.

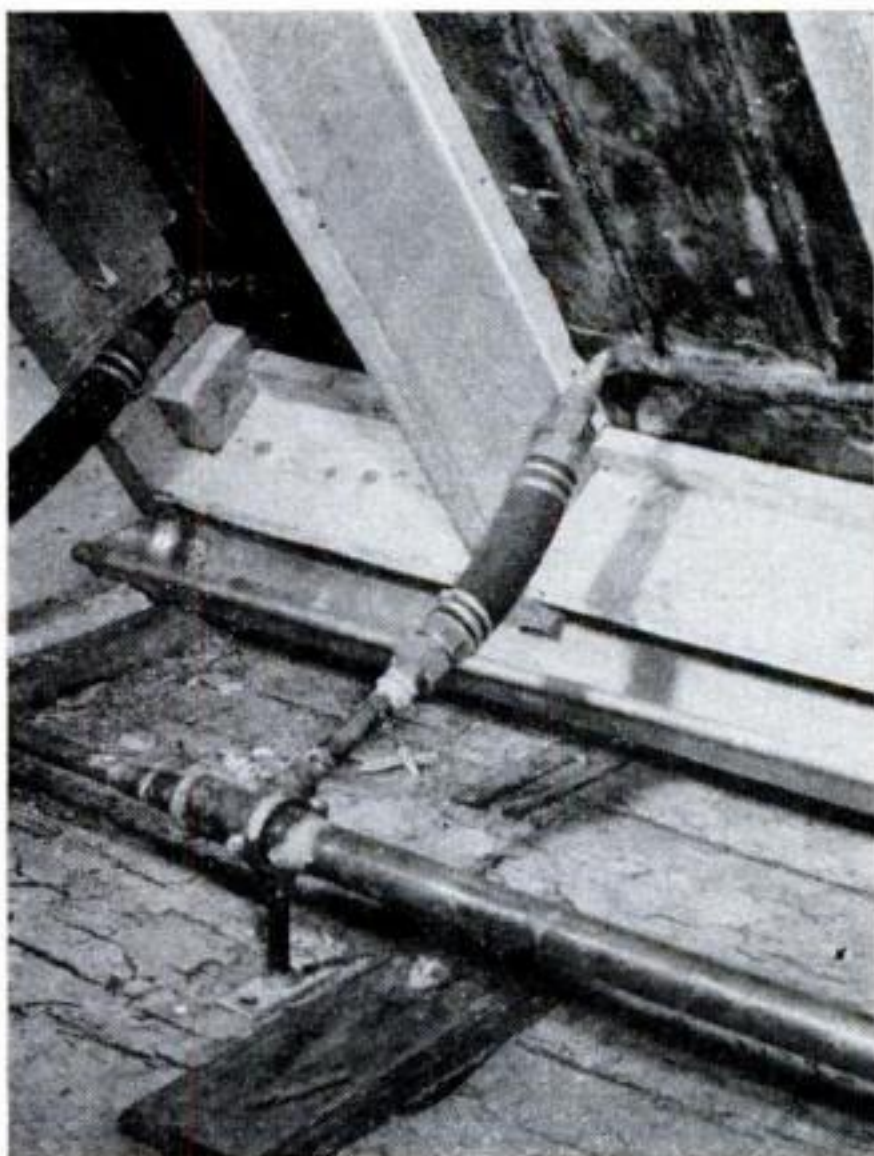
Bricks, scrap iron, and marble hold heat reasonably well. Some of them can be used in the walls. But the limited amount that can be built into a house will not hold enough heat. More hopeful is water. A cubic foot of water will hold 62.5 B.T.U. for every degree Fahrenheit its temperature is raised. Water weighs a lot less than iron or rock, and can be piped to carry the heat where needed. That's why water has been widely used in heat storage equipment.

Glauber's salt, a chemical used in photog-



View inside attic of M. I. T. house during construction shows 1,320-gallon tank that stores water heated by collector. Return connection at top left is still incomplete in picture. Pump that circulates water through radiant-heat panels in ceiling below is at far end, hidden behind workman. This pump is run by 1/16-hp.

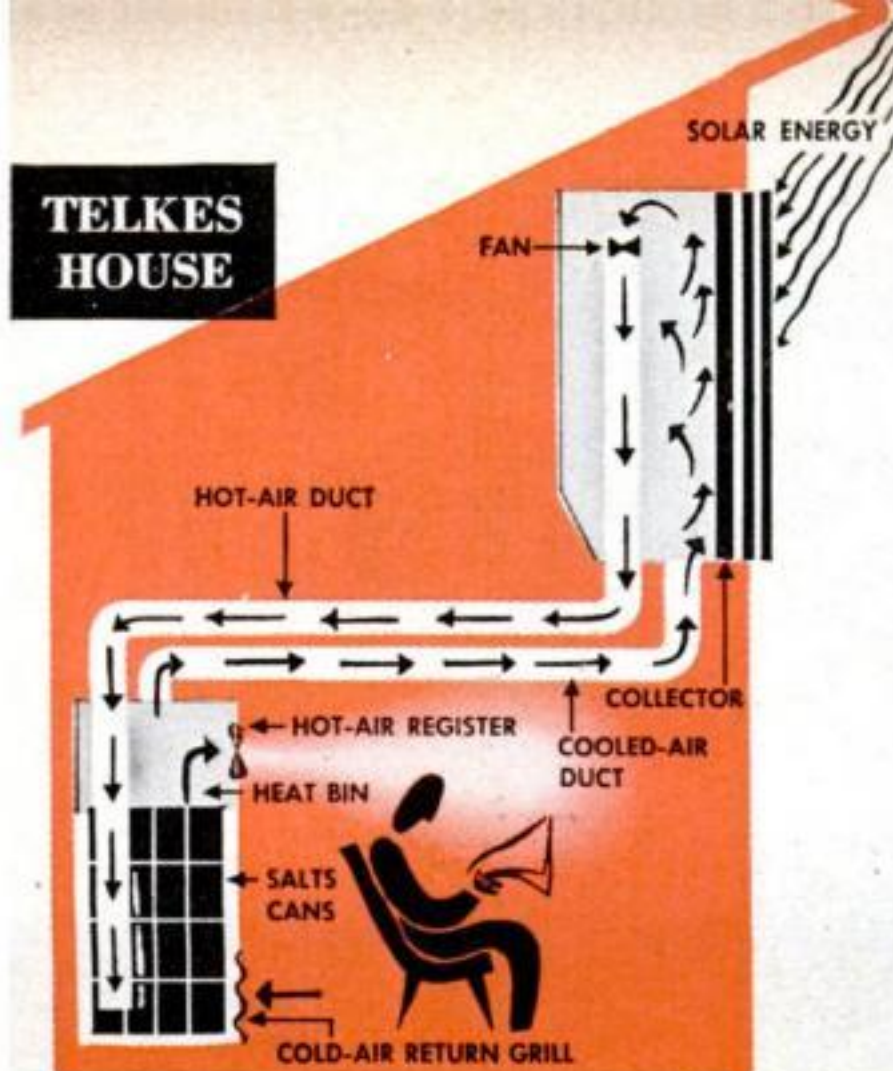
motor; separate pump for collector system, by one of 1/4 hp. Tank contains 1,200 gallons of water, leaving air space at top. Total weight of tank and water is six tons. To prevent loss of house heat, attic is insulated from rooms below. They contain 680 square feet of living area plus 60 square feet for instrument room.



View of lower edge of panel shows connection with bottom pipe that feeds tank water to pipes running up collector. The back of the panel, here exposed, is insulated in finished house.



Radiant coils in ceiling are connected to hot-water tank in attic above. Radiant system has its own circulating pump. Other hot-water types of heating could probably be used if preferred.



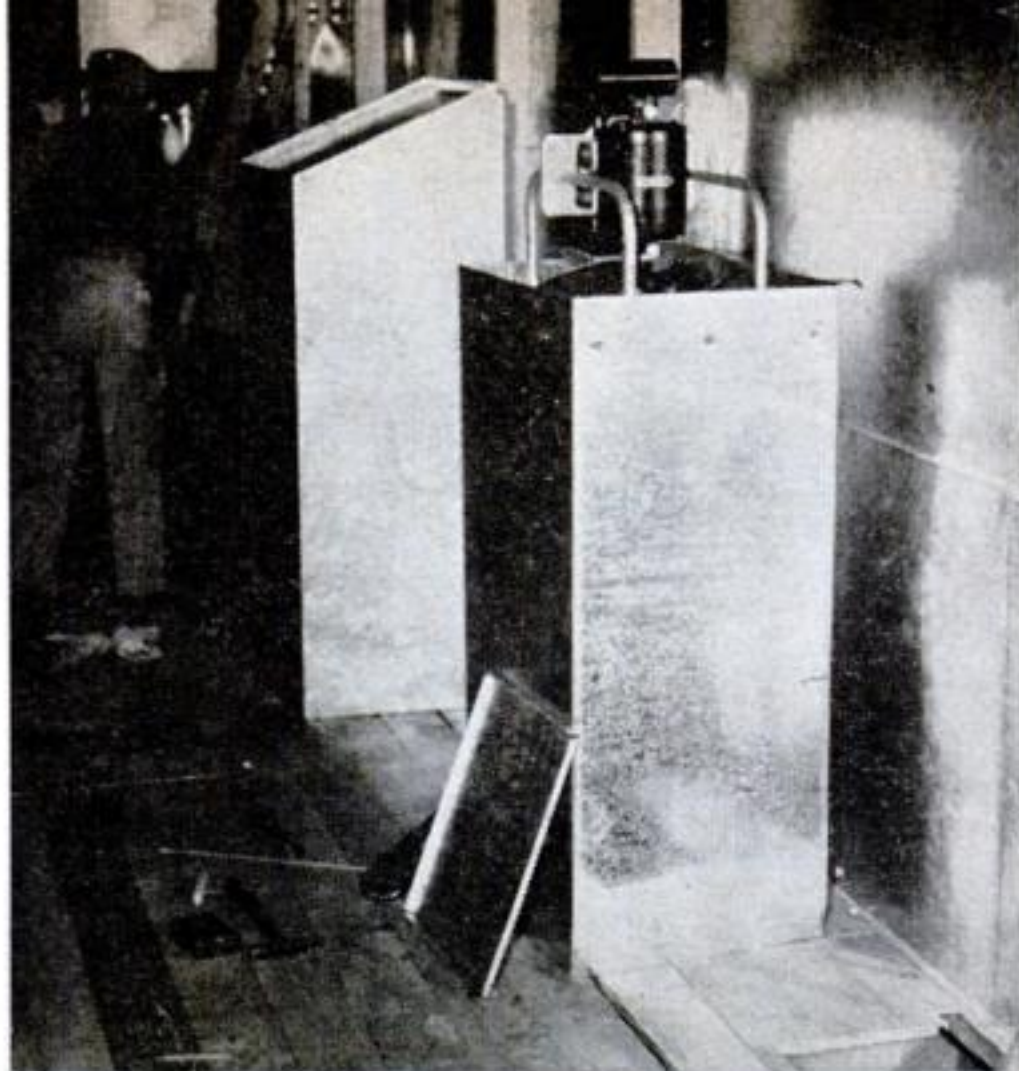
Telkes house collects heat at roof but stores it below. Storage bins of Glauber's salt are heated by air. They can be at back of room, as in diagram, or in partition closets.

raphy and dyeing, will store even more heat. It melts at 90° F. and in so doing absorbs 9,500 B.T.U. per cubic foot. When it recrystallizes, it gives this heat out again. Counting in the B.T.U. it can absorb before and after melting, the salt can soak up about seven times more heat than water. It tends to remain near 90° , a useful level for house heating, is comparatively cheap, and can be easily stored in metal cans.

Because of these advantages, Dr. Telkes uses Glauber's salt in her sun heating system. This has been built into a two-bedroom country house in Dover, Mass., outside of Boston, where its stark modern lines stand out in the New England countryside.

The collector, faced with inexpensive figured glass, forms a blind second story on the front of the house, which faces due south. The vertical collector is less efficient than one set at an angle, but it's less likely to catch snow and sleet. Besides, the overhanging roof keeps sunshine off the collector in the warm months.

An insulated wall three inches behind the collector plates of black-painted sheet steel makes an air space. The air is blown through this space, absorbs heat from the plate, then passes to salt-filled heat-storage bins below. Here the air circulates around the cans of salt, surrenders its heat to them, and returns to the collector for reheating. This circulation is continuous so long as



View during construction shows metal ducts in attic that circulate air between collector and bins below. In finished house, ducts are hidden by insulation, since attic is not heated.

enough solar energy is being received to keep the collector hotter than the cans. A fan register in each room warms the house.

Because of the high heat-storage capacity of the salt, the Telkes house has no other heating system. Dr. Telkes estimates that the cans hold enough heat for at least ten consecutive days of bad weather. Records show that even in Boston six consecutive days of below-average sunshine occur, on an average, only once in every 14 years.

The vital point—and one on which it is too early to have a definite report—is whether the Glauber's salt will absorb heat with its theoretical efficiency. According to some reports, the salt tends to stratify and lose much of its ability to absorb heat. Dr. Telkes is confident, however, that proper installation and use of the salt will overcome this problem. She has been living in the house herself since Christmas.

The M.I.T. house uses water as its storage agent. Since water is only a moderately efficient means of collecting calories, a lot of it is needed. Enough to carry a house through the worst of the winter would require an enormous, expensive tank; so this house doesn't depend entirely on the sun.

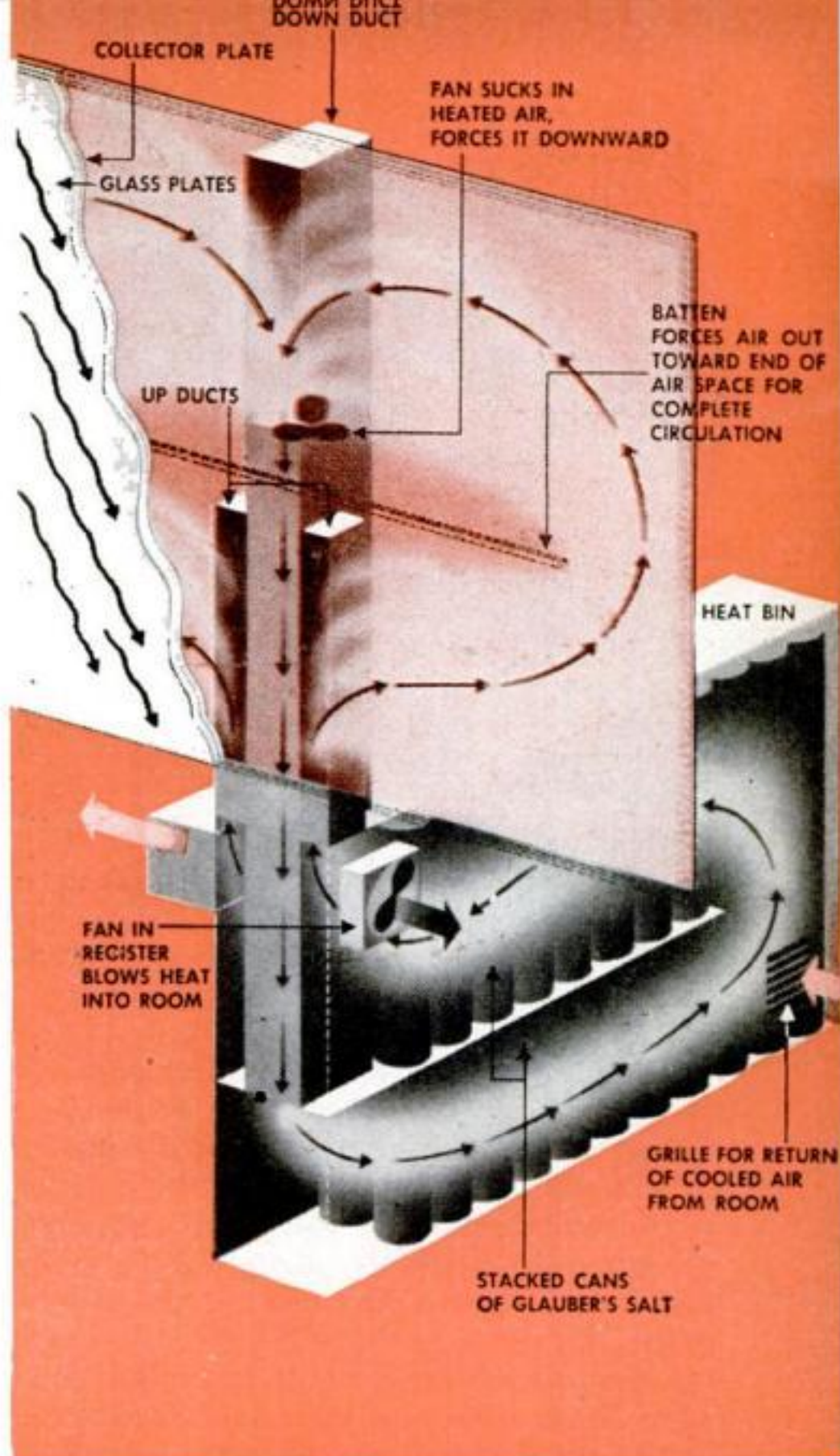
To obtain as much solar energy as possible in mid-winter, the collector-roof is set at an angle. The copper collector plate is ribbed every six inches by a vertical pipe, soldered to the back. Water pumped through



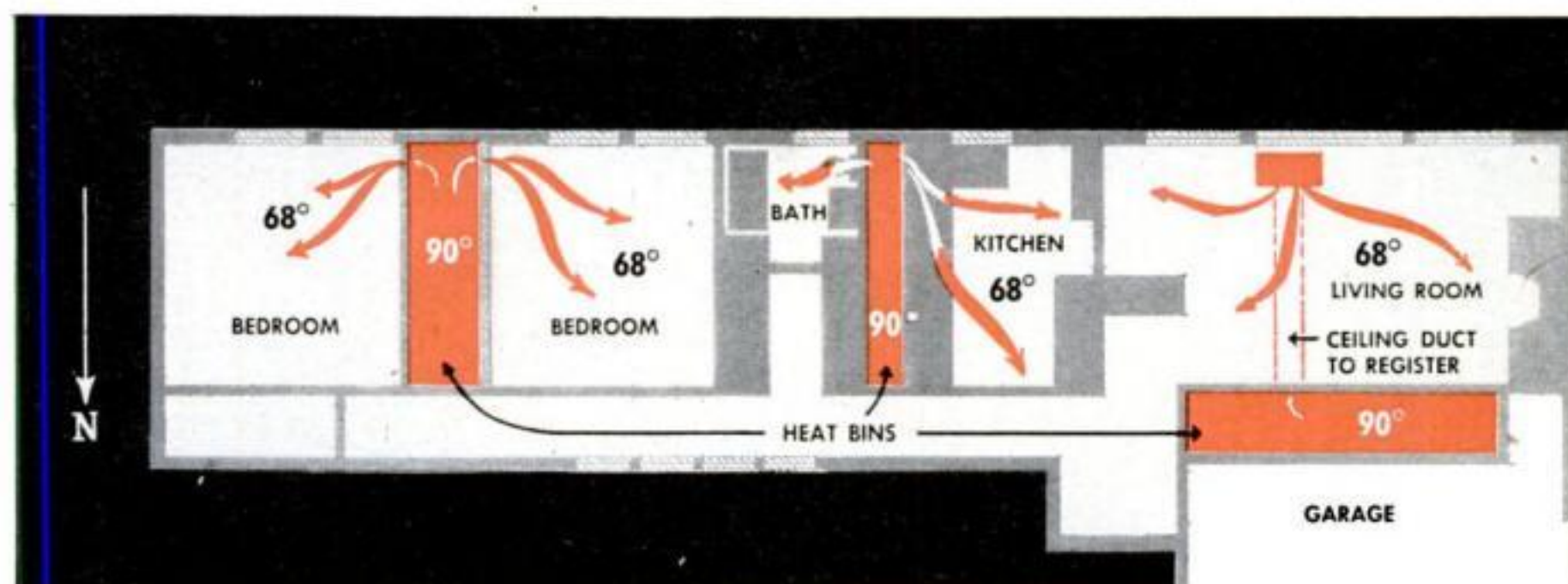
View of inside of bin shows stacked cans of Glauber's salt that actually store the heat. Closetlike bins are closed off from rest of house and need to be opened only for adjustments.

these pipes carries away the heat from the plate to a tank, the water circulating continually as long as the collector is at least 5° hotter than the tank water. When darkness or heavy clouds cause the collector to cool, the usual flow from tank to pump to collector is shut off, while another circuit from collector to pump to tank opens automatically. Thus the nonreversible pump can drain the collector, leaving empty pipes that will not freeze or pull heat from the tank.

A second electric pump circulates the heated tank water through the radiant heating coils in the ceilings of the room below.



Drawing shows close-up of one of three two-story collector-storage units in Telkes house. Wall fans and grilles blow out hot air into top of rooms, let cooled air return from bottom.

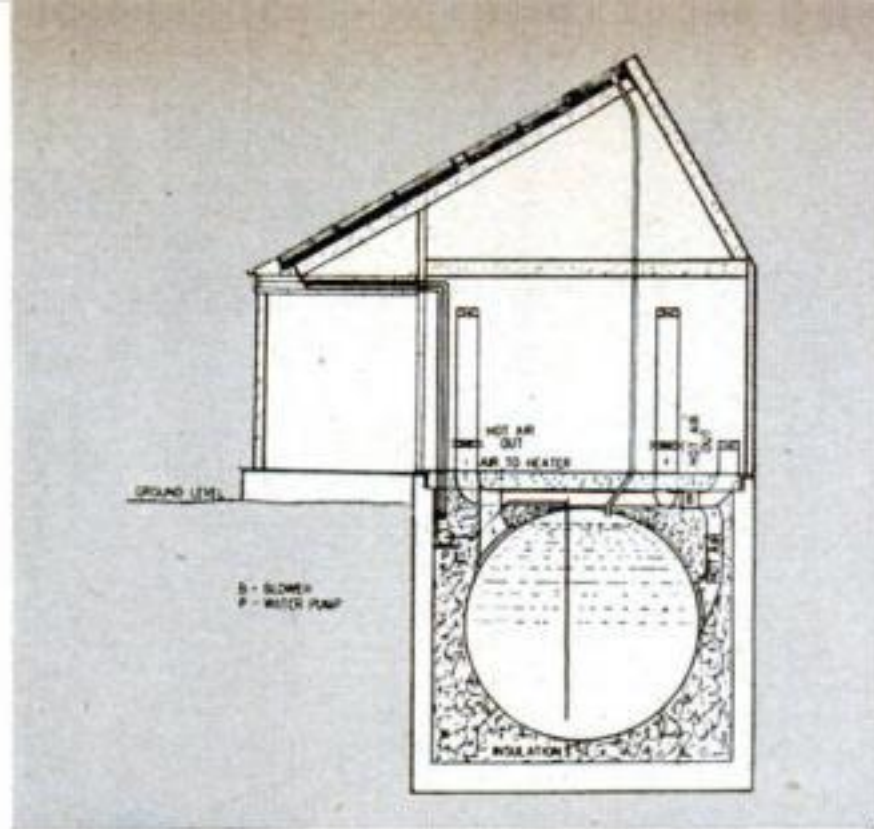


Plan of house using Telkes system, designed by Boston architect Eleanor Raymond, shows how heat bins are sandwiched between rooms or placed at back. Long hall with minimum of

windows on north side helps minimize heat loss. Fireplace is only conventional heating unit; and it's for pleasure, not utility. Whole house is heavily insulated against New England winter.



First M. I. T. sun-heated house, shown above, was 31 by 18 feet. It held lab, small office. Collector plates were similar to those now used, but water was piped to cellar tank.



Cross section of first M. I. T. house shows how 17,400-gallon tank filled huge cellar. It held water warm all winter, but cost made system uneconomical. Air warmed by tank heated house.

If a long spell of bad weather should drop the house temperature to 65° F., an electric heating unit in the tank switches on automatically. However, Edmund L. Czapek, M.I.T. research associate in charge of the project, predicts that the auxiliary unit will be needed only 5 to 10 percent of the time.

Assuming that both or either house works, how much does all this mean to the average householder? It depends on how easily costly apparatus could be redesigned for mass production. The Telkes heating unit is estimated to have cost about \$3,000. No exact cost figures are available on the M.I.T. system. Both houses are expensively insulated. It is estimated that Boston, with some 105 clear days a year, is farthest north for practicable sun heating. Beyond that, the collector gets too big for the house.

Other methods of using solar energy—photosynthesis, thermocouples, photoelectric cells—are being studied at M.I.T. and

all over the world. But right now, house heating is the most hopeful. Eugene Ayres of Gulf Research and Development estimates that if we could harness the sun to do just one-half the space heating we need, world consumption of diminishing fuels would be cut by 4.5 trillion horsepower hours per annum. He thinks this is quite likely to happen during the next 100 years.

A house cannot compete in drama with the towering cloud of death that rose over Hiroshima. Yet the sun furnace may be the more important portent of the two.

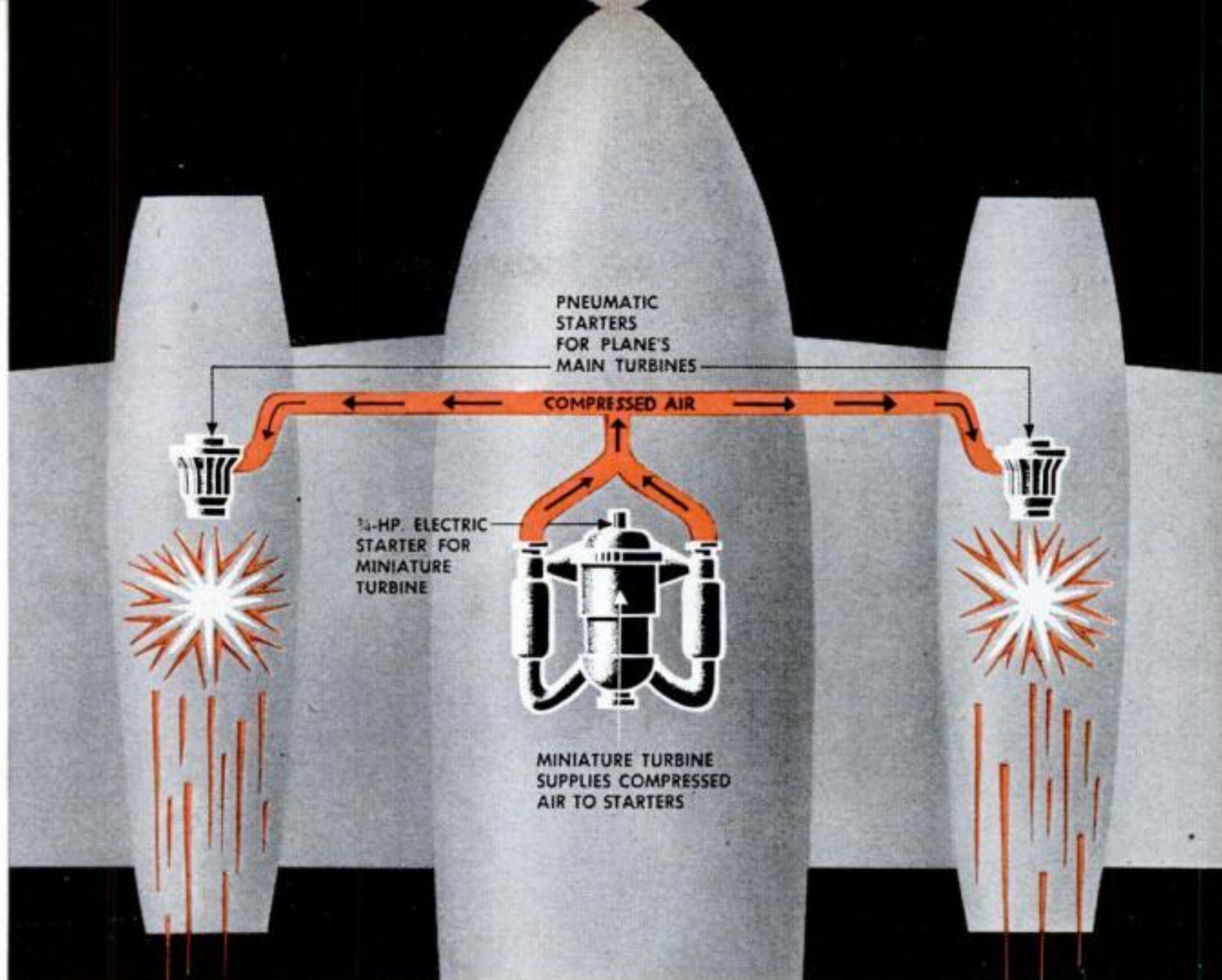
The energy released by the atomic bomb is matched every day by the sunlight that falls on 1½ square miles of land. The world's supply of uranium and thorium—the only two elements at present potential sources of atomic energy—are definitely limited and nonrenewable. In contrast, the energy locked into sunlight is far greater. And it renews itself at dawn each morning. **END**



Second M. I. T. house had glass south wall as collector instead of roof. This view shows insulated curtains down to prevent loss of heat outward at night and during bad weather.



Inside view of second M. I. T. house shows how cans of salts were stacked behind glass south wall to store heat. Research associate E. L. Czapek is shown studying recording instruments.



Tiny Turbine Twists Jet Starter

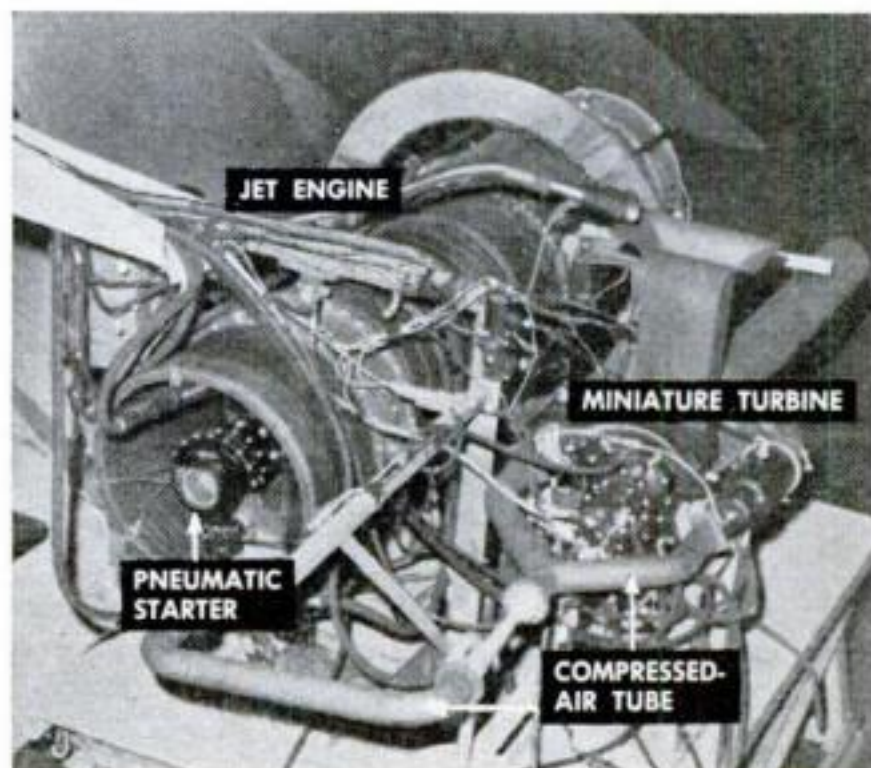
IT takes a powerful twist to start a jet's engine. The air compressor must be spun until it builds up a high-pressure fuel mixture that is ignited by an electric spark—and the jet blast roars.

Built-in electrical starters will do the trick in an emergency, but they put a punishing load on the batteries: if the engine doesn't catch the first time, you're stuck. Usually, starting on the ground is done by wheeling up storage batteries or other heavy auxiliary power units.

Now the Navy thinks it has the answer in a new 88-pound self-starter developed by the AiResearch Manufacturing Co. Actually it's a pint-sized gas turbine that is kicked over, at the touch of a button, by its own ¼-hp. electric starter. Spinning at 40,000 r.p.m., the unit supplies compressed air to a pneumatic starter attached directly to the main jet engine.

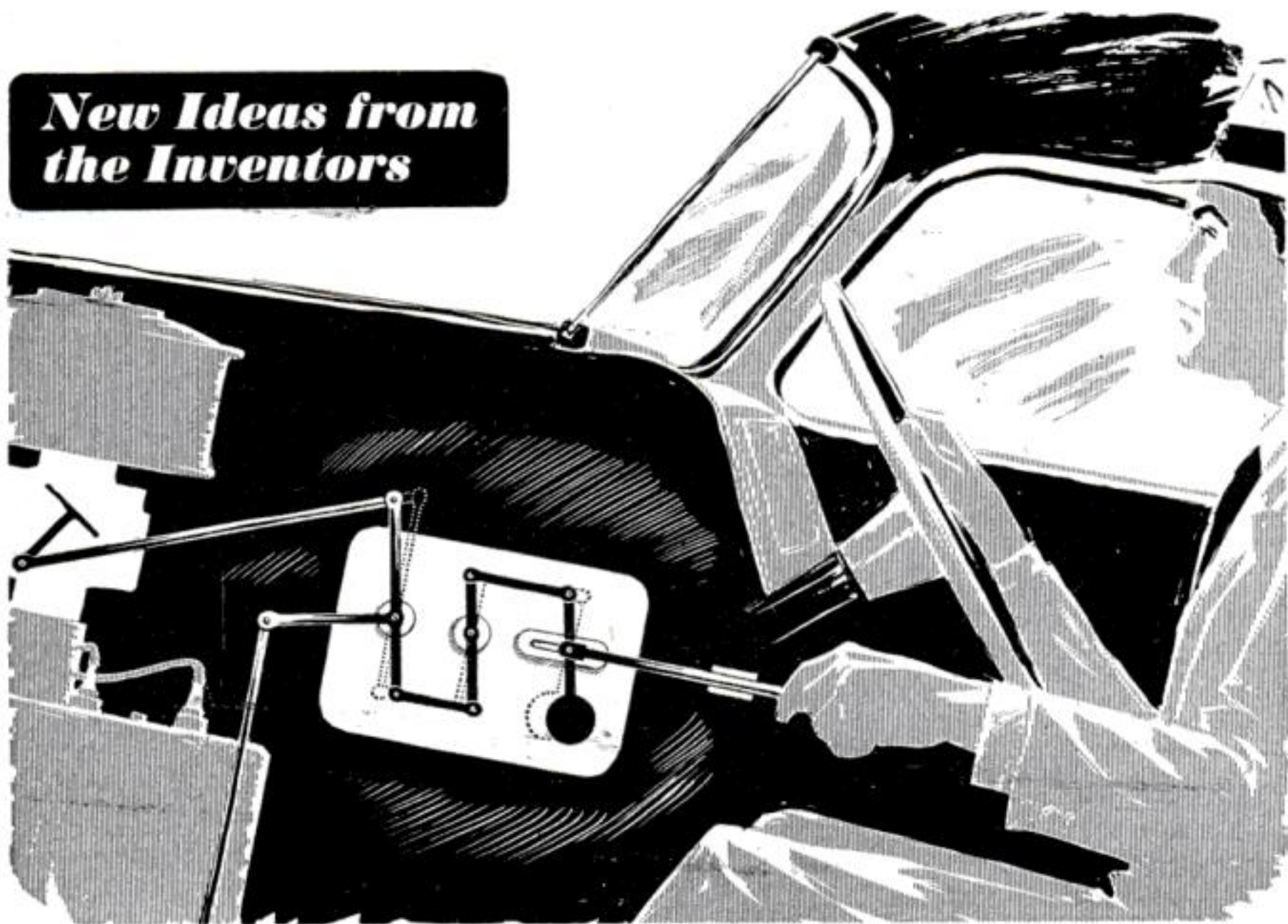
The entire starting system weighs only 104 pounds, as compared with 220 for an electrical starter plus batteries.

Although engineering problems will not permit its installation in current models, the Navy plans to build the new starter into two future jet planes. **END**



Miniature turbine starter unit is shown at right above in demonstration installation. Piping shows how compressed air is bled off to run pneumatic starter on main engine.

New Ideas from the Inventors



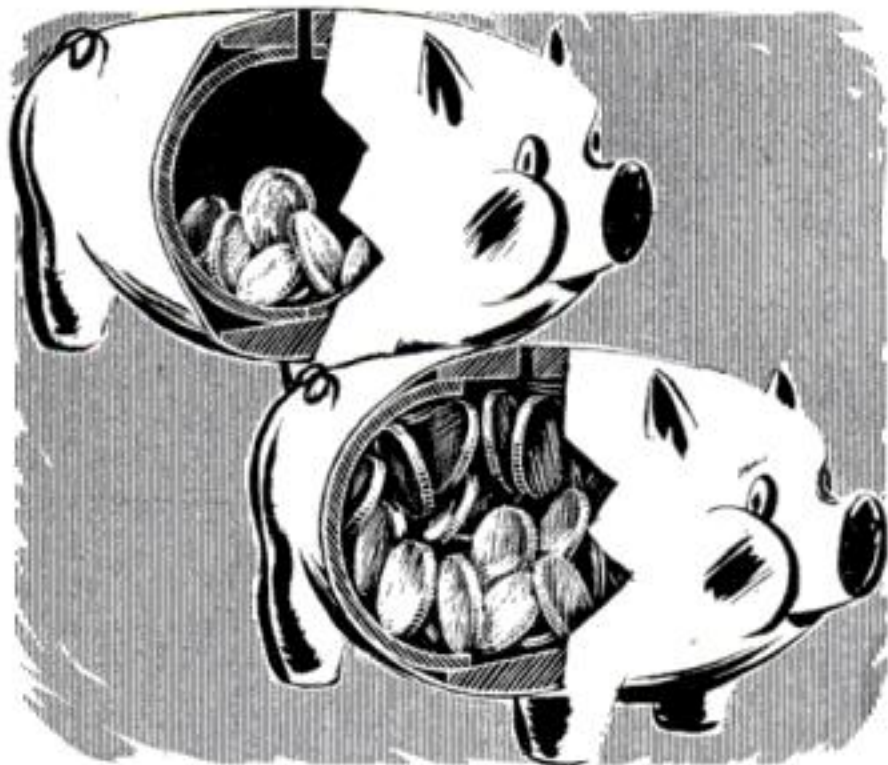
Pendulum Controls Car Speed.

A weighted pendulum does the work of your accelerator foot in the invention of P. J. Burchett, of Glendale, Calif. Connected to the accelerator control rod, it swings back-

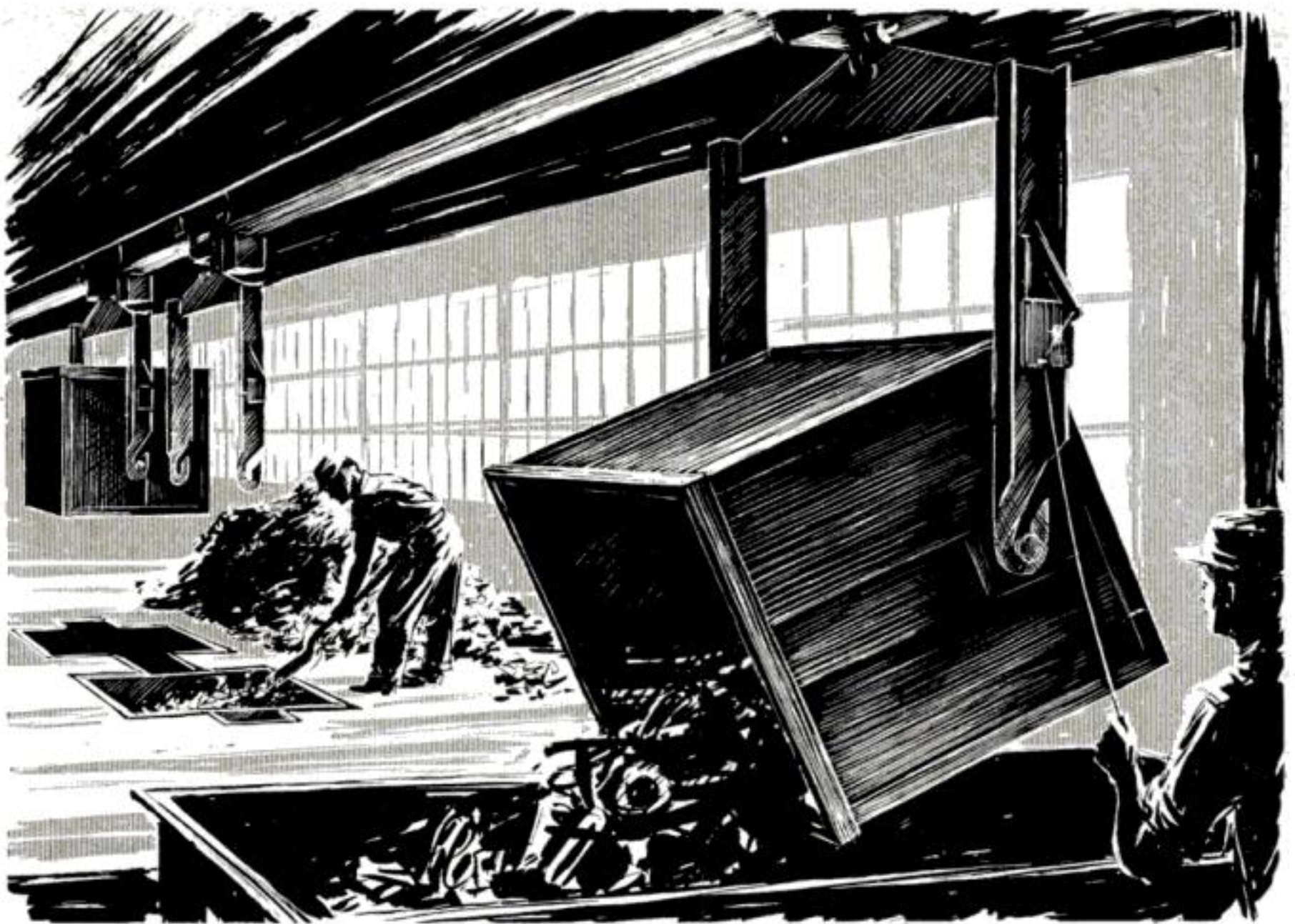
ward on an upgrade to increase power and forward on a downgrade to decrease it. Braking also throws it forward, reducing speed. A hand throttle sets the speed. The accelerator can be used independently.



Shoe Has Hinged Heel. You wouldn't have to struggle with shoehorns or laces to get these novel shoes on. The back part, hinged at the heel, swings open to let the foot slide in easily. Snapped closed, it provides a snug fit without any fasteners. A spring clamp locks the heel in place. The inventor is J. R. Napton, of Marshall, Mo.



Coins Fatten Piggy Bank. Children might get more fun out of saving their pennies with this expanding piggy bank. As the coins pile up inside, they gradually push apart the two sides of a split, spherical container. These force the elastic sides of the pig to bulge outward. The bank was invented by J. W. Kimball, of Athens, O.



Bucket Dumps Itself. No motors or winches are required to operate this bucket. Pivoted near the bottom, it is top-heavy when filled. When a release cord is pulled, it automatically tips over, dumping

its contents. When empty, however, its weighted bottom returns it to an upright position, ready for the next load. Invented by G. H. Johnson, of Rockford, Ill., it can be lowered into floor pits for easy filling.



Ladders Make Scaffold. These Z-shaped brackets are designed to convert two ordinary ladders into a safe and simple scaffold. Invented by T. E. Graham, of Oklahoma City, they hook onto three rungs of each ladder and support a plank across them. Their Z shape distributes the pressure over three rungs and prevents slipping.

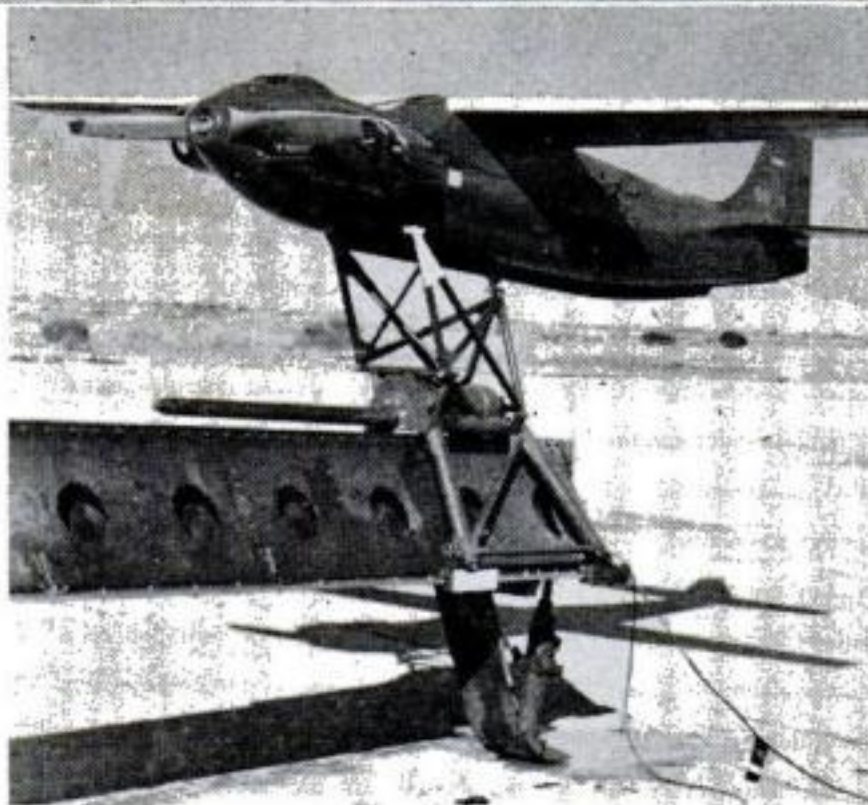


Waste Can Smothers Fires. A fire wouldn't last long in the waste basket patented by D. A. Florence, of Philadelphia. When one starts, a lid, normally held open by a chain, falls shut, closing the can and smothering the fire. A fusible link in the lid's chain melts when heated, breaking the chain and letting the lid fall.



Rocket Launches Target Plane

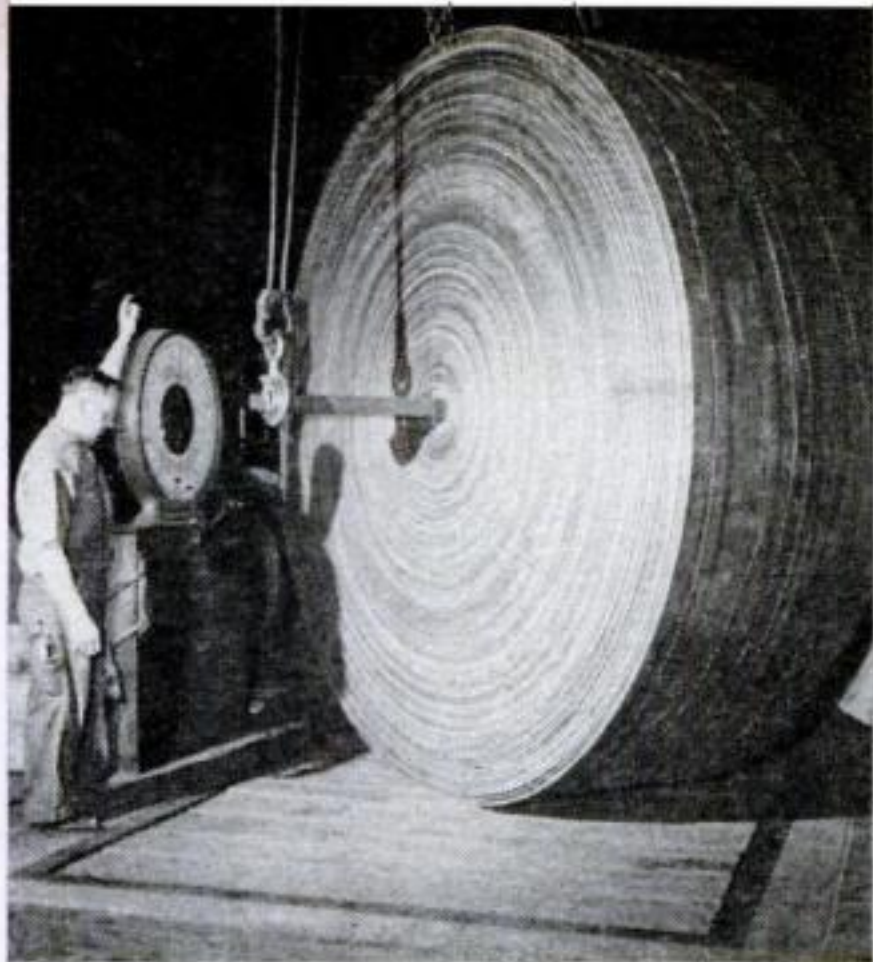
THE Air Force's newest flying target, the OQ-19A, takes off from a rocket ramp at 80 m.p.h. The 300-pound plane, designed to simulate fighter tactics, has a speed of 220 m.p.h. and can be remotely controlled from either ground or air. It will be used for both antiaircraft and aerial gunnery practice. The craft is landed by means of a 32-foot cargo-type parachute that is released by the controller. In case of damage to the plane by direct hits, the chute opens automatically. The target plane is 10½ feet long, stands 2½ feet high, and has a wing span of 12 feet. It can climb 2,400 feet a minute to a service ceiling of 20,000 feet.



Twin Jets Power "Flying Lab"

SWEPTBACK wings distinguish the Air Force's latest research plane, the tiny Northrop X-4 shown above. It was not built for speeds in excess of sound, like the X-1 (PS, Aug. '48, p. 96), but is intended for exploring flight characteristics at high subsonic speeds.

Since it is powered by gas turbines, the X-4 is capable of considerably longer flights than the rocket-powered X-1. One of the smallest man-carrying planes ever built, it is 20 ft. long and has a wing span of about 25 ft. The experimental plane has a tricycle landing gear and an ejection seat for the pilot.



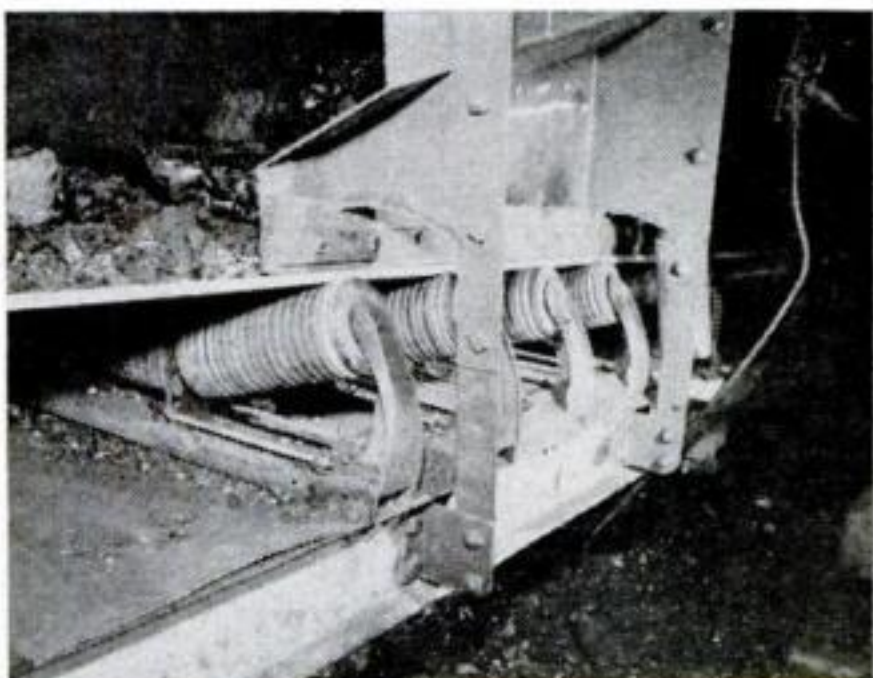
Roll of heavy-duty belt, 1,060 ft. long and 36 in. wide, tips scale at 6 tons before shipment from Passaic, N. J., factory. Five sections like this were spliced to make finished conveyer.



Overland conveyer spans rugged Pennsylvania countryside on trestlework (shown while still under construction). It carries coal from mine head, in distance, to railroad loading point.



Coal starts its long ride out of the mine as hopper pours it onto continuously moving belt at one of two underground loading points. This one is 700 feet vertically below the surface.



Side view shows rubber-covered steel idlers that cushion conveyer against shock at loading points. Belt is described as 250 to 400 percent stronger than others of similar construction.

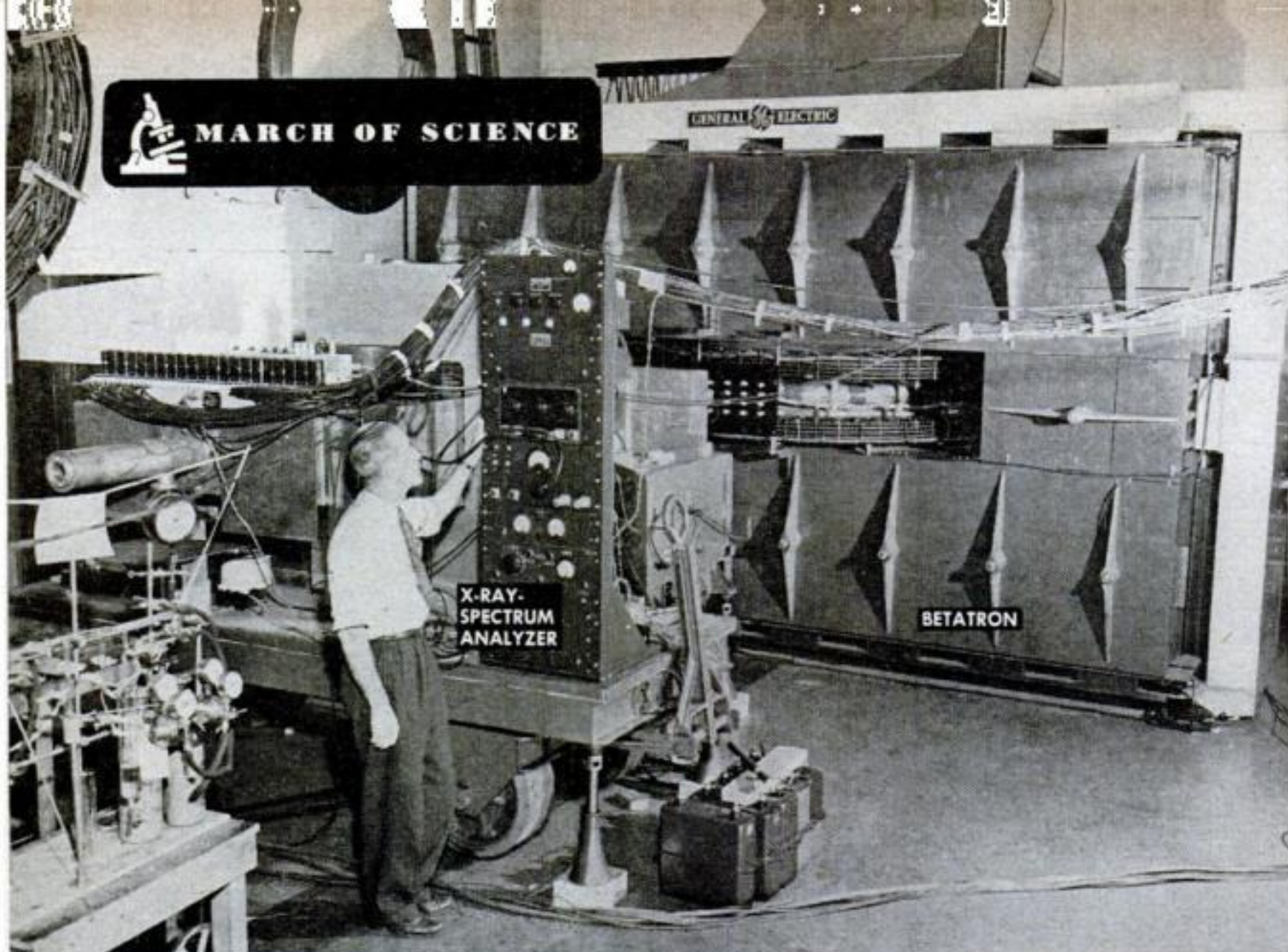
Coal Rides Mile-Long Belt

A CONVEYER belt more than a mile long is now rolling 300 tons of hard coal an hour out of a Pennsylvania mine that had been shut down since 1931 because of the high cost of hauling its output to the surface in mine cars.

At the mine head, this conveyer dumps its load onto another belt that carries the coal 1,300 feet overland to a railroad loading point. Together, the two belts cut the distance the coal must travel by more than half—and the colliery's cost of producing a ton of coal by about 50 cents.

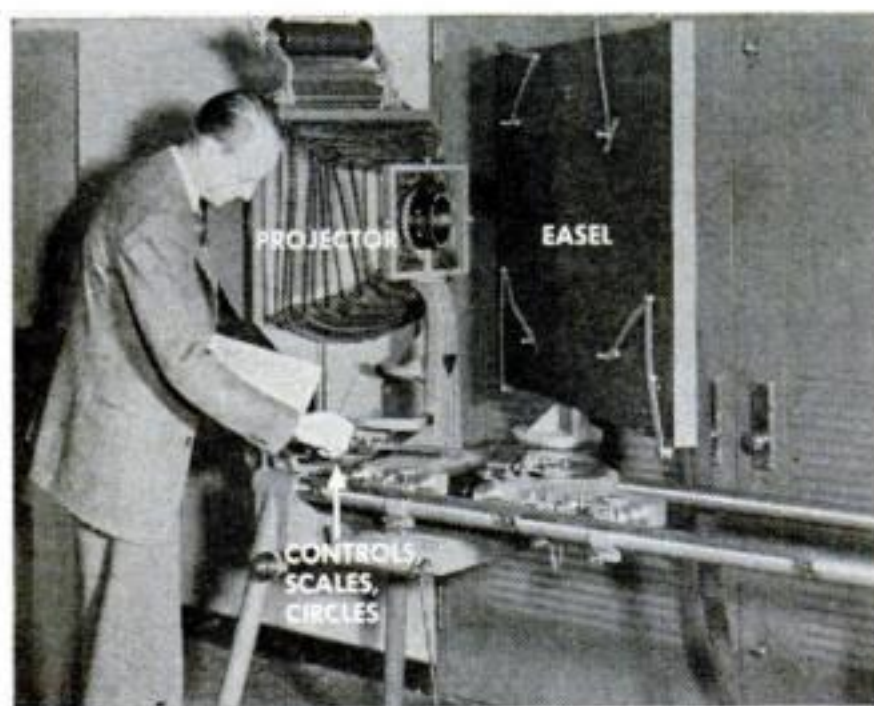
The underground belt, driven by a 400-horsepower engine, is said to be the longest inclined coal conveyer in the world. From the deepest of two loading points, at the center of a spider web of mile-long mine tunnels, it travels 2,640 feet to the surface up a 15-degree slope.

Both belts are made of rubber impregnated with fabric woven of high-strength cotton and nylon fibers. They were produced and installed by the U. S. Rubber Co. for the Moffat Coal Co., which operates the Storrs Colliery near Scranton, Pa.

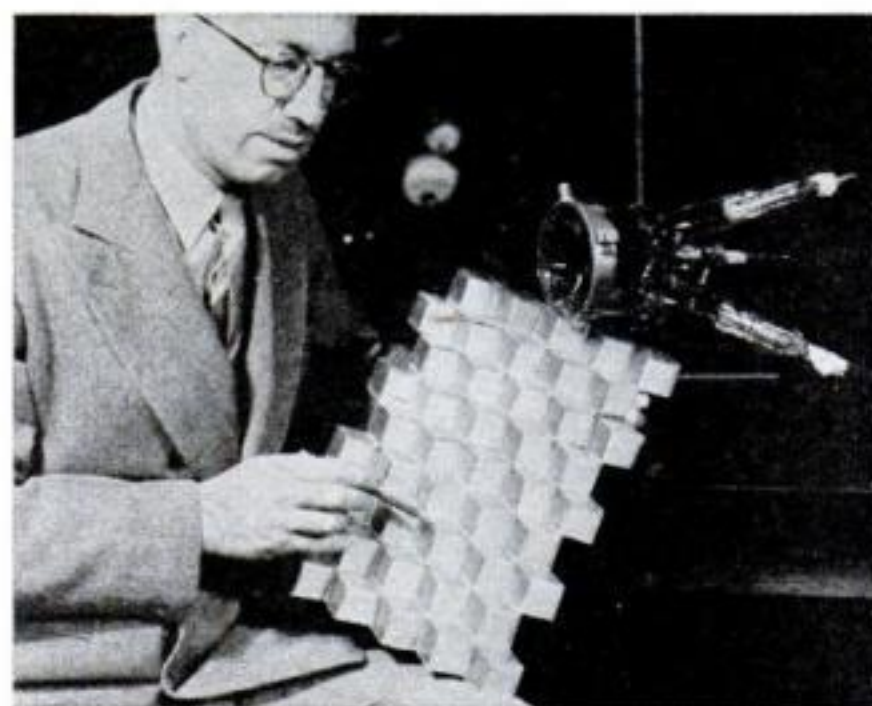


Magnet Analyzes X Rays. The eight-ton apparatus in the foreground above measures the distribution of energy in a beam of X rays from GE's 100,000,000-volt betatron. Electrically charged particles are produced from the rays and shot through a

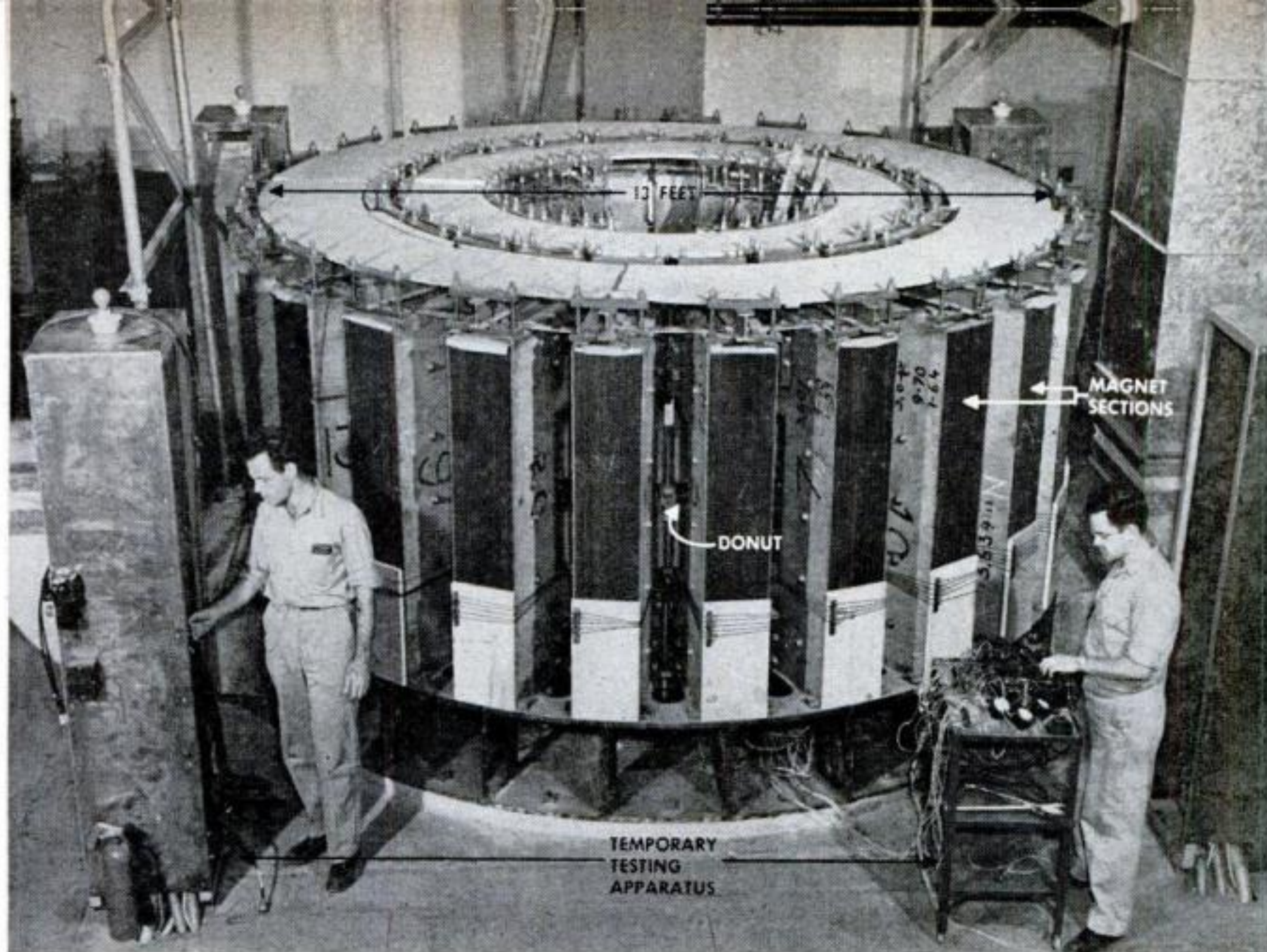
magnetic field. Their curvature in this field shows how much energy they have. Where each one hits is noted by a battery of 100 Geiger counters, whose reports are tabulated by a 300-tube electronic calculator. This saves physicists a lot of time.



Photoprinter Aids Mappers. This new projector and hinged easel extends the coverage of reconnaissance planes. Aerial photographers can now shoot undistorted pictures from angles other than straight down: high-angle shots are pulled back into shape simply by printing them at the same angle. The equipment, used by Army map makers at Ft. Belvoir, Va., is light enough to cart around in a truck.

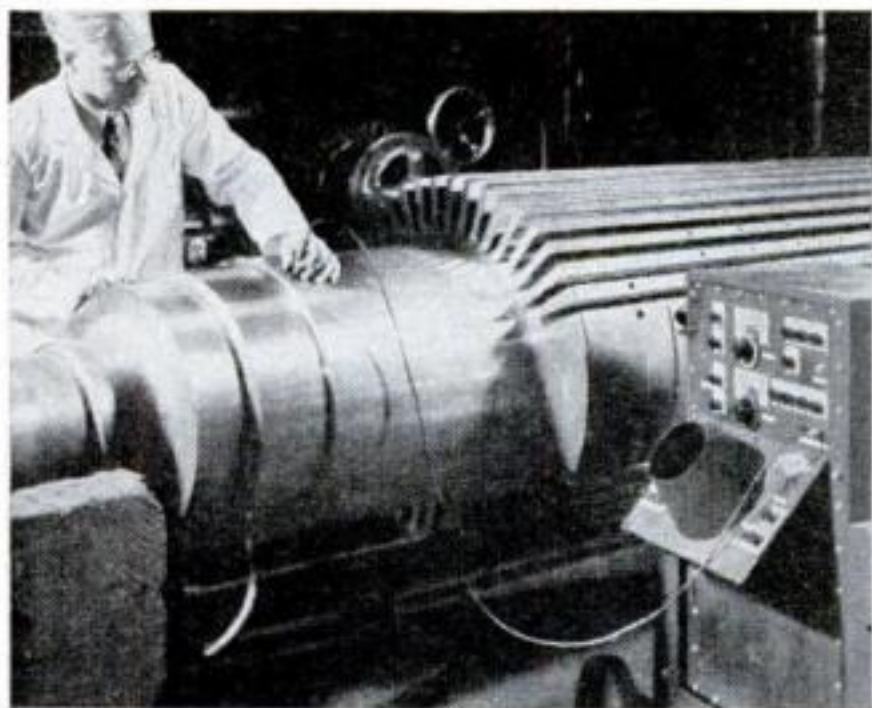


Tube Shows TV in Color. Dr. Willard Geer, U.S.C. physicist, displays a greatly enlarged model of the back of his full-color television screen. Each side of the three-sided pyramids is coated to glow with one of the primary colors. For each color a separate electron gun, built into the three-pronged tube at right, is aimed to sweep only one side of the pyramids. The resulting spots of color blend into a single image.

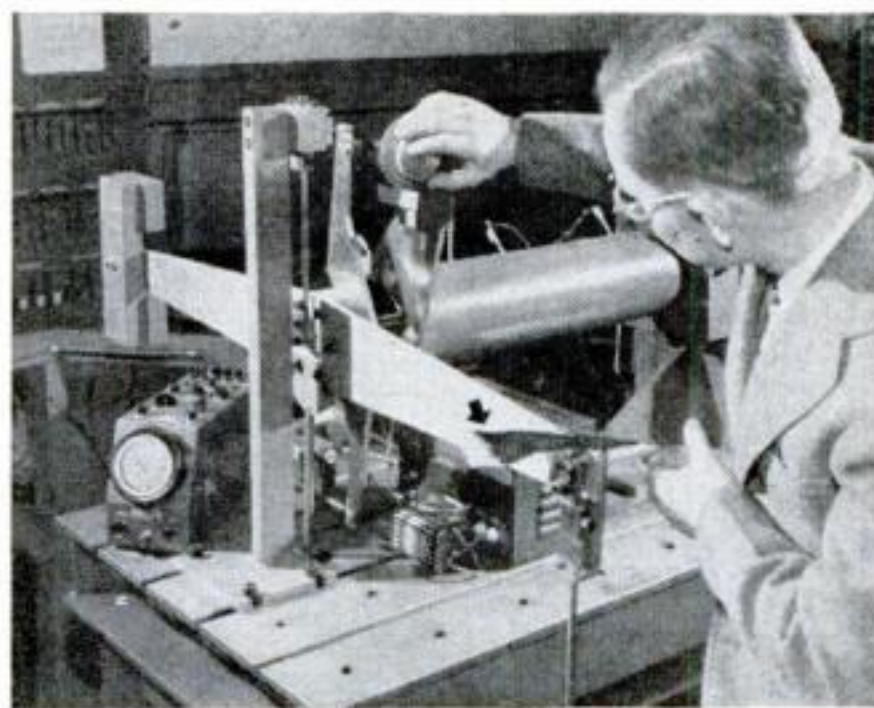


Atom Buster Is Born. This 85-ton synchrotron, shown nearing completion, is part of a new \$2,000,000 Laboratory of Nuclear Studies at Cornell University, Ithaca, N. Y. Generators, switchboard, and condensers are in separate rooms. In operation,

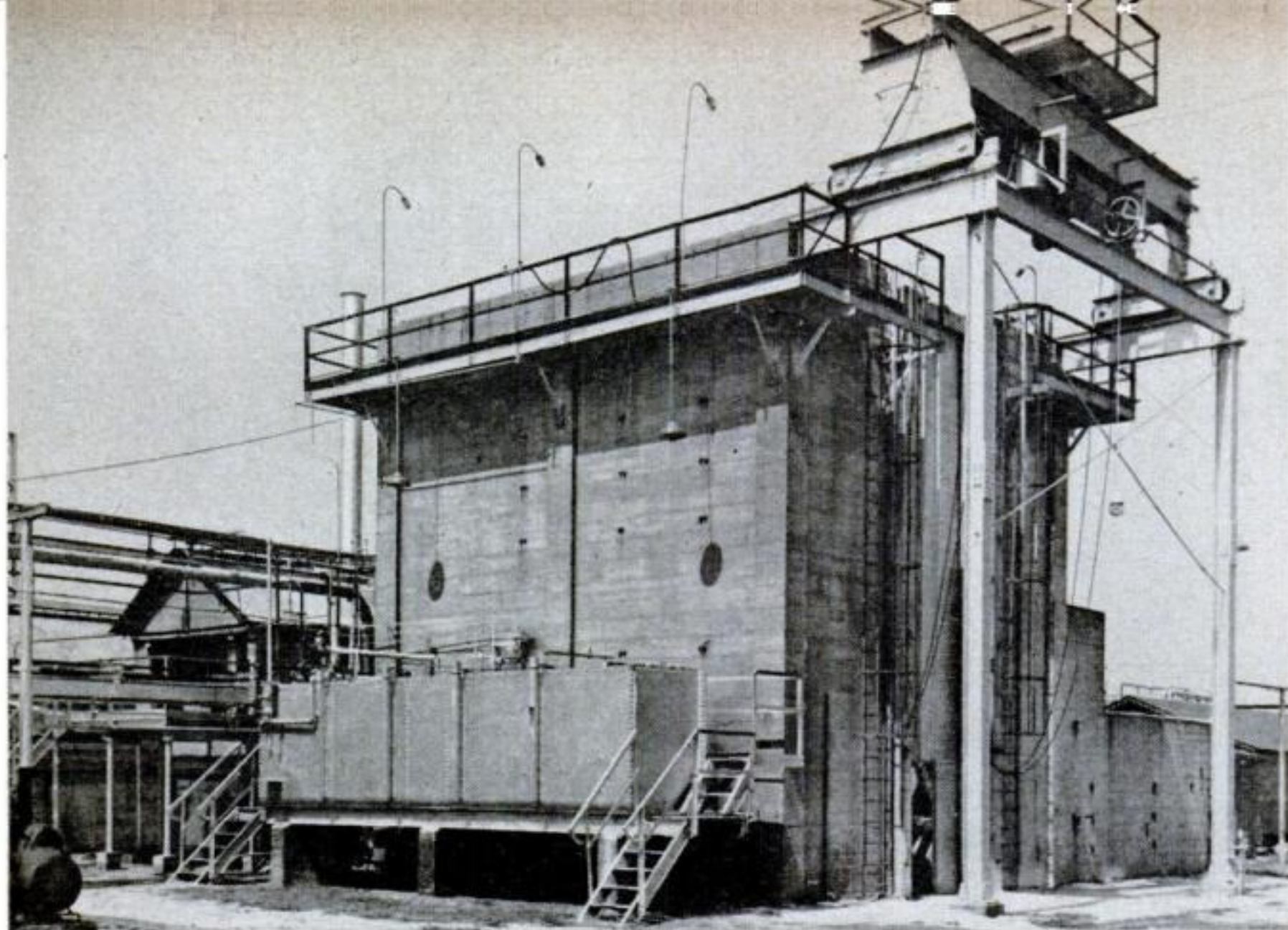
the synchrotron will hum like a big transformer as its ring of magnets pulls electrons around a glass-tube race track, called the donut, at an energy of 300,000,000 electron volts. New theories about electricity may result from experiments with the apparatus.



Stethoscope Tests Metal. This massive generator shaft, too thick to X-ray, is getting a physical checkup with a Westinghouse ultrasonic "stethoscope." High-frequency sound waves, projected through solid steel up to 30 feet thick, bounce back from the other side—or when they hit an internal flaw. Precise timing of the echo, recorded as a bright line on the viewing screen at right, locates any defect.



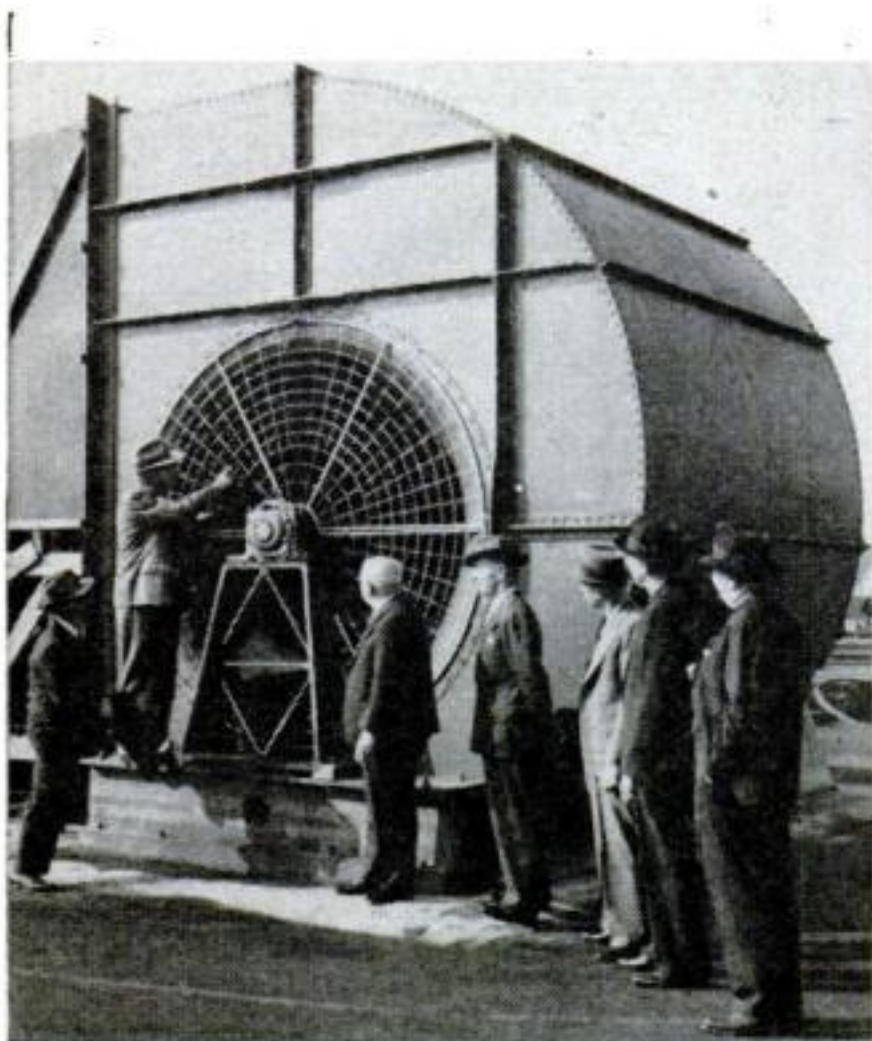
Feather Twists Steel Shaft. The electrical-contact fingertips of this twist detector are so sensitive they can measure the movement caused by placing a feather (arrow) on a crossarm bolted to a 1-in. steel shaft. (Answer: the shaft, inside the cylinder extending to the right, twists less than 1/1,000,000 in.) Westinghouse uses the device in designing instruments to measure the power delivered by rotating machinery.



Alcohol Made from Gasoline

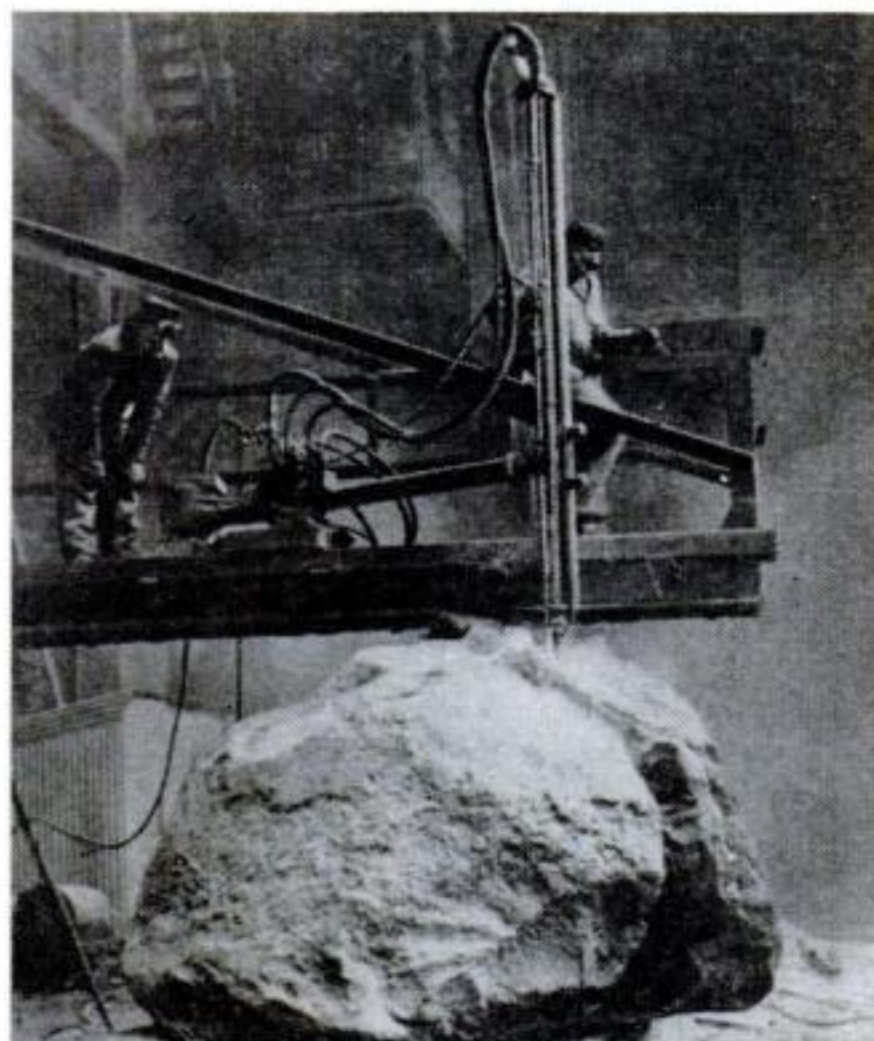
SYNTHETIC alcohol for use in the manufacture of plastics is made under a pressure

of 3,000 lb. per sq. in. in this Esso plant at Baton Rouge. Gasoline, hydrogen, and carbon monoxide react in the presence of a catalyst to form the iso-octyl alcohol.



Blower Breathes for Tunnel

THIS giant, 15-foot-high Westinghouse fan will blow 281,000 cu. ft. of fresh air a minute into New York's Brooklyn-Battery Tunnel. It is one of 53 fans that will feed the tunnel 25,000 tons of air an hour.



World's Biggest Blowpipe

THIS big blowpipe, largest in the world, can cut through 6-foot-thick chunks of steel that formerly had to be blasted apart. Made by Linde Air Products, the mixer-type pipe burns acetylene under medium pressure.



"Can you get this spot out?" "Yes, Mr. Loosbrock—if you can tell what you spilled on it."

What the Cleaner Does to Your Suit

By John F. Loosbrock

REMEMBER that suit that came back from the dry cleaner with the spot that wasn't there when you sent it? Made you mad, didn't it? And the cleaner said, "Leave it with us a week or so, and we'll either get it out or find out why it won't come out."

Chances are your spotted suit then became one of the thousand-odd problem garments that every month roll into the "chamber of horrors" of the National Institute of Cleaning and Dyeing at Silver Spring, Md., near Washington, D. C. More

Suit starts through model plant operated by National Institute of Cleaning and Dyeing at Silver Spring, Md. Marker attaches identification tags of soft cloth with large safety pins. ➡



MARCH 1949 121

than 7,000 institute members, in the U. S. and 27 foreign countries, use its free analysis service to untangle their knottier cleaning problems. And its word is usually taken as gospel by small-claims courts and Better Business Bureaus throughout the nation.

If the Institute experts looked over your stained suit, they put it under an ultraviolet light. The spot then may have showed up as a light-yellow stain. That would have meant it was tannin, arch villain of the dry-cleaning business.

It also would have meant that the stain probably was there to stay, since the suit had already been pressed. Heat will set a tannin stain until nothing can get it out except a pair of scissors. And it's probably the most common of all stains—caused by soft drinks, beer, ale, highballs; tea, or coffee. If only you had told your cleaner what you spilled on the suit, he could have removed the stain before pressing.

Besides its analysis service for members, the Institute runs a model commercial cleaning shop to set standards for this billion-dollar-a-year industry. The pictures on these pages show how its experts gave one of my suits the works as a demonstration for POPULAR SCIENCE readers.

Detectives Identify Holes

A common customer complaint, says the Institute's analysis department, is the discovery of a hole that shows up for the first time after cleaning. Perhaps the customer had brushed up against some battery acid. The spot wasn't noticed, the suit went to the cleaner's, the heat of finishing evaporated the water out of the weak acid solution. Result: a hole where none was before, an irate customer, and a red-faced cleaner.

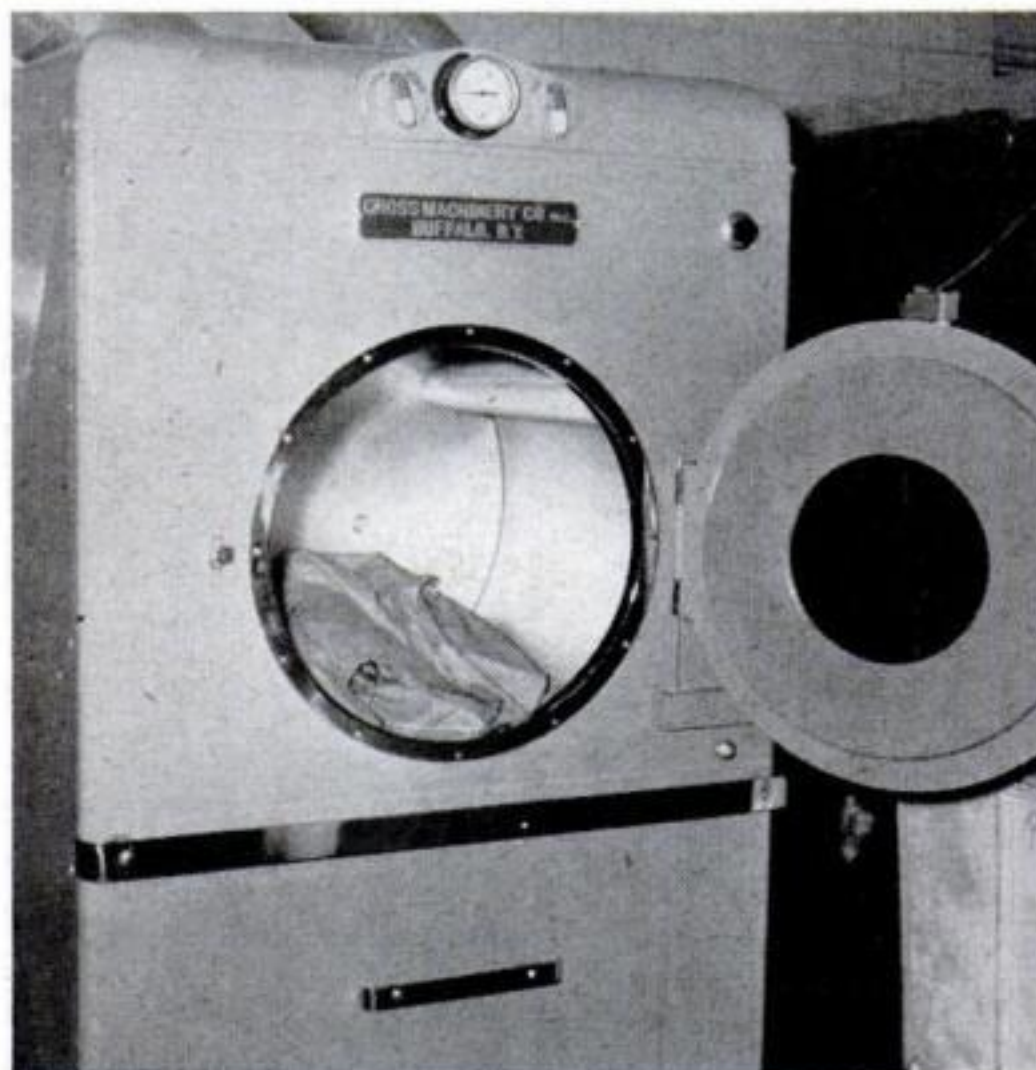
The Institute puts a hole like that under the ultraviolet lamp. If it's an ordinary tear, it looks about the same as in daylight. But if it's chemical damage, a light ring appears around the hole, showing further damage not visible to the naked eye. And if the cleaner wasn't told about the damage when he received the suit, he's usually absolved.

Or a suit may fade and the cleaner be blamed. The Institute experts examine the underside of the lapels and the inside of the cuffs. If the color in those places is clear and fresh, they conclude that the sun caused the fading. If it were the cleaner, the suit would have faded all over.

They may also snip a swatch of material from an inside seam and put it in the fadom-



Revolving brushes whisk lint from trouser cuffs before a suit is cleaned. Pockets are turned inside out. A "pre-spotter" removes any stains that might be set by the cleaning process.

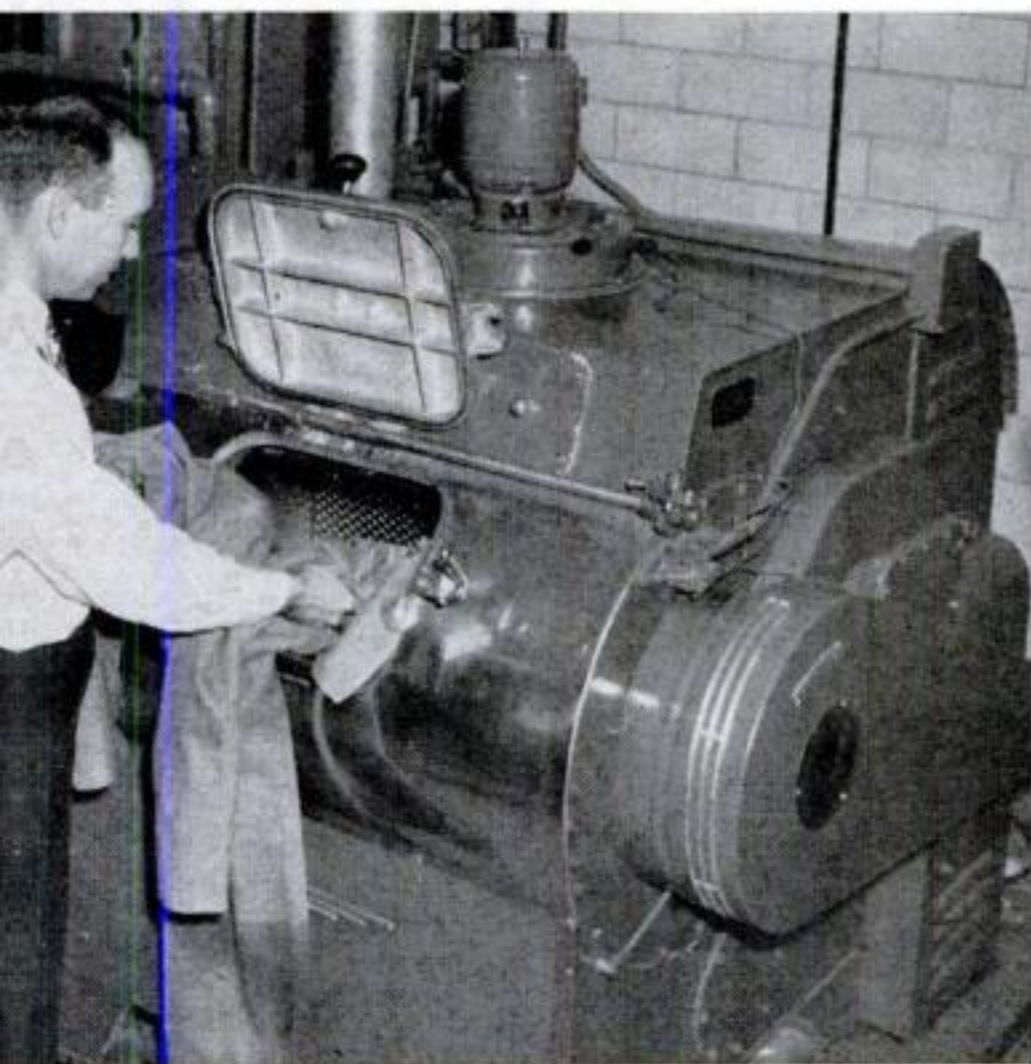


To complete drying, suit is put into this tumbler. As drum revolves, a current of warm air carries off remaining solvent. Speed and heat can be varied for different types of garments.



Dry-cleaning machine (center) works like a rotary-drum home washer. It uses petroleum-base solvent instead of water and synthetic detergents instead of soap. At left is filter

through which solvent is continuously circulated, at 3,000 gallons an hour, to strain out dirt. From washer, garments go into spin-drier (right) where most of solvent is whirled out.



Another type of washer both cleans and dries. It uses synthetic solvent that is noninflammable but gives off toxic fumes. These are caught inside sealed machine, condensed, and re-used.



Stains not removed by solvent are taken out by "spotter," the artist of dry cleaning. He uses steam jet and a battery of stain-removing agents. Toughest trick is to avoid leaving a ring.



Coat is finished on form inflated with steam, then hot air, to restore shape. Lapels must roll perfectly, shoulders round neatly. Sleeves and lapels are then touched up by pressing.



Trousers are finished on steam presser. Screened head (upper plate) prevents shine. Other heads adapt it to smooth or rough fabric. Heat, pressure controls prevent shrinking, scorching.

eter, which simulates sunlight with a powerful carbon arc. If the sample fades, that clinches it. Claim dismissed.

But if the cleaner has been at fault, the Institute will say so. It plays no favorites. In fact, it likes to track down faulty cleaning practices. Doing so helps to raise the standards of the industry as a whole.

Another common gripe is the fading or changing color of acetate rayons containing blue dyes. Ever send a rayon sport shirt to the cleaner and have it come back a sickly pinkish purple? That wasn't the cleaner's fault. It probably was caused by atmospheric gases in your home—from a stove, furnace, or water heater. The heat of pressing merely hastened the process. The Institute can prove it in a minute by putting an unfaded swatch in a miniature gas chamber.

The increase in synthetic fabrics during and since the war has been a big headache for cleaners. Says the Institute's managing director, J. M. Matson: "Before the war, claims against dry cleaning plants ran about one-half of 1 percent of total sales. Now they're running about 1½ percent. People used to know pretty well what they were buying. Now they can't be sure. It's our job to find the answers before the cleaner gets hurt."

That's one of the reasons the Institute's research and analysis departments are moving into a new million-dollar building.

As an example of the Institute's work, research director George P. Fulton points with pride to his campaign against buttons and ornaments of polystyrene plastic. A clear plastic, cheaper than glass, it has a disconcerting habit of disappearing completely in cleaning solvent. The Institute worked closely with manufacturers—and now the polystyrene button has pretty well disappeared from the market too.

Top item of current research is the evolution of a standard soil swatch of cloth for tests. Then the Institute can set more definite standards for soaps and solvents.

Its experts are also looking into why wool shrinks. They like the idea of chemically preshrunk wools. And they don't think these will drive the dry cleaner out of business. Even though wools may eventually be washed like cottons, they'll still need careful finishing.

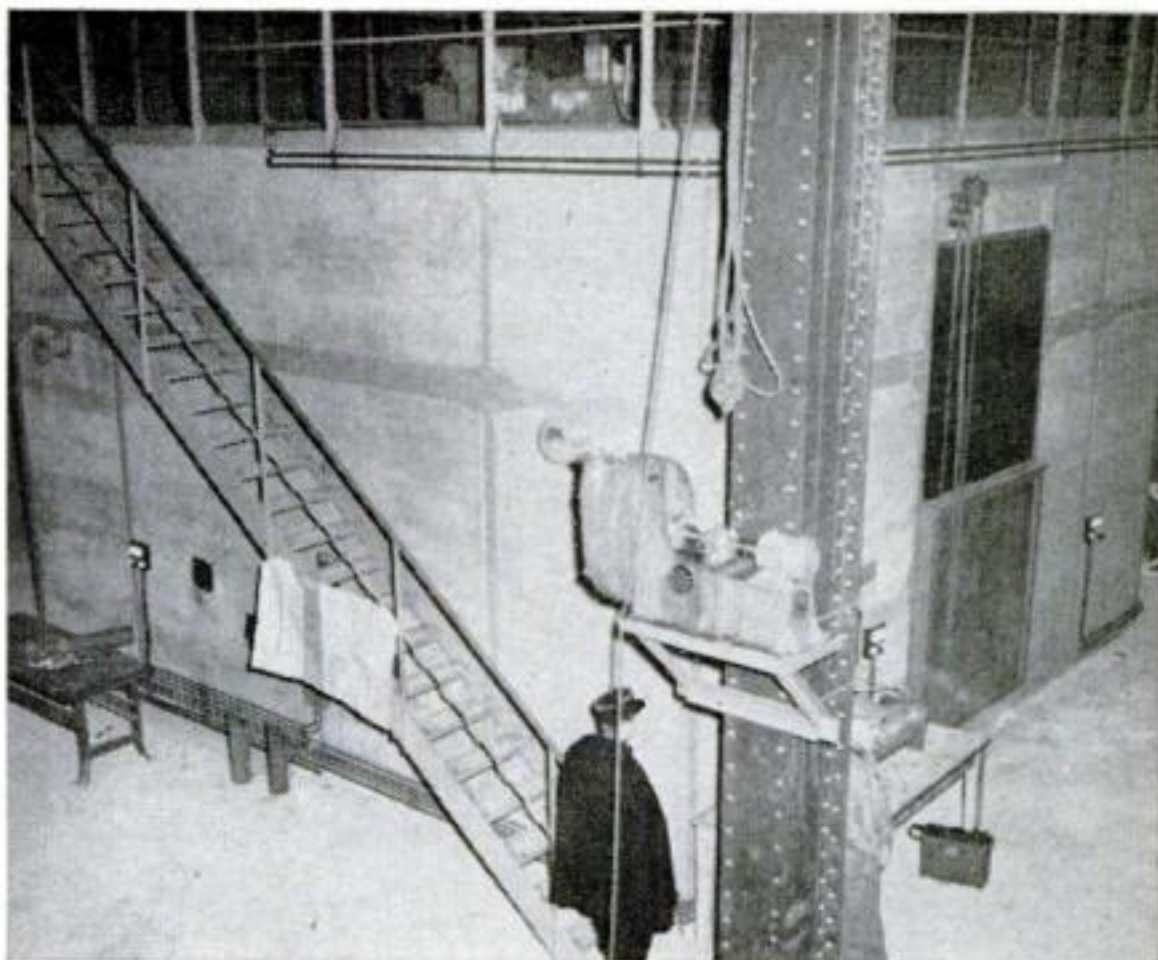
END

Manpower Surpasses Horsepower

AN ATHLETE may achieve an output of energy as high as 10 to 13 horsepower in a 100-yard sprint, a British physiologist reports.

France Starts An Atomic Pile

THE concrete room at right contains the first atomic pile known to be operating outside the U.S., Britain, and Canada. Run by the French Government at Fort de Chatillon, near Paris, it recently began producing neutrons by chain reaction of uranium. Unlike most U.S. piles, it uses heavy water instead of graphite as its second essential element. Intended only for research, the small French pile generates little power and no significant amount of materials for bombs.



New Bulb Glows All Over

THE man who invented the frosted light bulb, back in 1925, has now developed one that scatters its rays even better. He is Marvin Pipkin, of GE, shown pointing to the improved lamp as it glows—right down to its base—alongside its predecessor and a clear-glass bulb at left. The inside of the new lamp is coated with a white silica substance that diffuses light almost perfectly without cutting down its brightness.



Fruit Passes Flight Test

WILL fruits and vegetables burst if shipped in high-flying planes? To find out, the Dept. of Agriculture "flew" 34 kinds—including this tomato, flanked by micrometers—in Lockheed's altitude chamber. All stood low pressures equivalent to 30,000 ft.



Pellets Save Seeds, Aid Growth

TINY garden seeds often are wasted by being sown too thick. Now Henry A. Dreer, of Philadelphia, puts them in pellets that not only add bulk and weight but include fertilizer, vitamins, hormones, insecticide. Above: coated and plain sugar-beet seeds.



This operator in New York can ring telephones in 70 cities—from Lowell, Mass., to Chicago—just by pressing the keys near her right hand. Ten keys correspond to finger holes in or-

dinary dial, three control the complex switching mechanism. Card index at left tells operator how to route calls and gives codes that must be punched to reach certain areas of country.

This Maze Saves 1 Minute

New toll-dialing equipment cuts time for long-distance connections in half.

YOU can call any place in the country in about two minutes now. But soon it will take only one minute.

The Bell System's new toll-dialing equipment, which enables an operator to connect your phone directly to telephones hundreds of miles away, is expected to cut the time needed for long-distance calls in half. The saving comes from eliminating the work of a second operator at the other end.

Already serving 300 cities, the new equipment is rapidly being installed all over the country. It will be years, however, before it covers all the United States and Canada.

It takes a mass of fantastically complex apparatus to save you that minute. The recently completed installation in New York

alone cost \$13,000,000 and occupies space on six floors of a big building. A crew of 400 technicians spent a year setting it up.

To talk to your aunt in Chicago from your home in New York, you now simply give the number to the New York operator. She punches the number (plus in some cases a geographical code) on ten buttons. And your aunt's phone rings.

Toll-dialing is only part of still more complicated—but easier to use—systems to come. Ultimately, Bell plans direct connection between any two telephones anywhere in the country. That requires another huge mass of equipment to keep tabs on your calls so that the company knows how much to bill you (PS, Feb. '49, p. 135).

Phone-to-phone dialing will then not only save time but lengthen the odds against your getting a wrong number.



This is only a part of the maze of wiring, switches, and other apparatus needed to enable an operator to dial long-distance as shown on opposite page. The mammoth New York installation has 2,000 circuits to permit connection to about 70 distant points. There are 522

"frames" of the crossbar switches that make the actual connections, 655 "bays" of relay racks, 89 tons of batteries, and—in case of power failure—four motor-generator sets. Much of this equipment must be called into action to complete one call, which requires 100,000 electrical contacts.



This huge Diesel truck-trailer combination is typical of motor-express trains that haul 68 per-

cent of all freight in western states. Drivers halt only for fuel, servicing, and meals.

Highballing the Highway Freighters

Photographed at truck stations of Standard Oil Company of California by Jon Brenneis

As a specialized machine, today's great highway motor freighter has become as complicated as a railroad locomotive.

Big rigs, with two gear shifts, have as many as 32 speeds. Shifting these behemoths, while steering with one arm through the wheel and both hands on the gear levers, is no job for a boy.

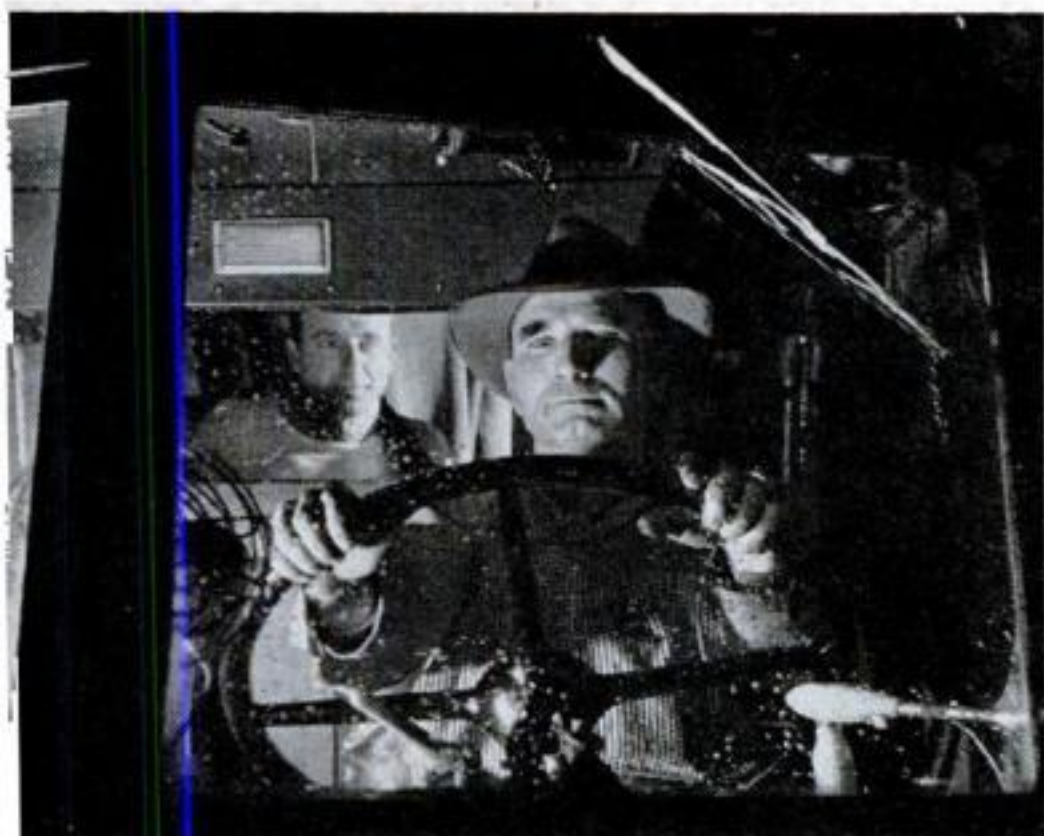
Gears, not motor acceleration, regulate speed. On downhill grades a close watch must be kept on the tachometer if the powerful engine is not to tear itself to pieces.

Big trucks travel at 40 to 50 m.p.h. on the straight, level stretches. Some of the newer Diesels, however, can hit 90. Engines

of up to 300 horsepower permit a good driver to stay in higher gears on grades and maintain a faster schedule.

Drivers are as conscious of the wind as an airplane pilot. A headwind that would go almost unnoticed by a motorist can force the driver of a big van to go down two notches in his gears to maintain headway.

In 11 western states, 15,000 communities depend entirely on motor express. But the truck-trailer combinations are now a part of the American scene in every state. Indeed, some trucks have become wheeled versions of the tramp steamer, swapping loads as they roam the country. Recently one furniture-van driver was nine months out from his home port, had visited 16 states—and was still going strong!



Two drivers highball highway freighter day and night. On single trip, it may run through rain, mountain snowdrifts, desert sandstorm. Runs of 1,000 miles in 36 hours aren't unusual. While one man drives eight hours, other sleeps on box springs and mattress in separate room behind cab. Some veterans say they sleep better on the road than at home. Like sailors, truckers keep their narrow quarters neat and clean. Checkups by inspectors of Interstate Commerce Commission encourage this tradition.



Pet peeve of long-haul trucker is mechanical "squealer" (right), staring at him from top of dashboard. This gimmick keeps record for home office of freighter's mileage, speed, time on road, length of stops. A more serious problem is lack of uniformity in state laws limiting trucks' weight, length, height, load. About 60 feet is maximum length. Restrictions in Midwest bar biggest "combos" from coast-to-coast runs. California, one of the most liberal states, allows a gross weight of 75,200 pounds.



Outsize gas stations, with extra-wide lanes, fuel and service the highway trains. This one at Redding, Calif., takes care of four at once. Fuel and air hoses unroll to let station attendants move around longest truck-trailer combinations. It's nothing for a Diesel to take on 280

gallons of oil in one drink. Water and steam are used to knock off road dirt. As much as 1,300 pounds of dust and grime may be washed off a truck after an overnight run. Some stations have machines to blow crushed ice over loads of fresh meat, fruits, and vegetables.



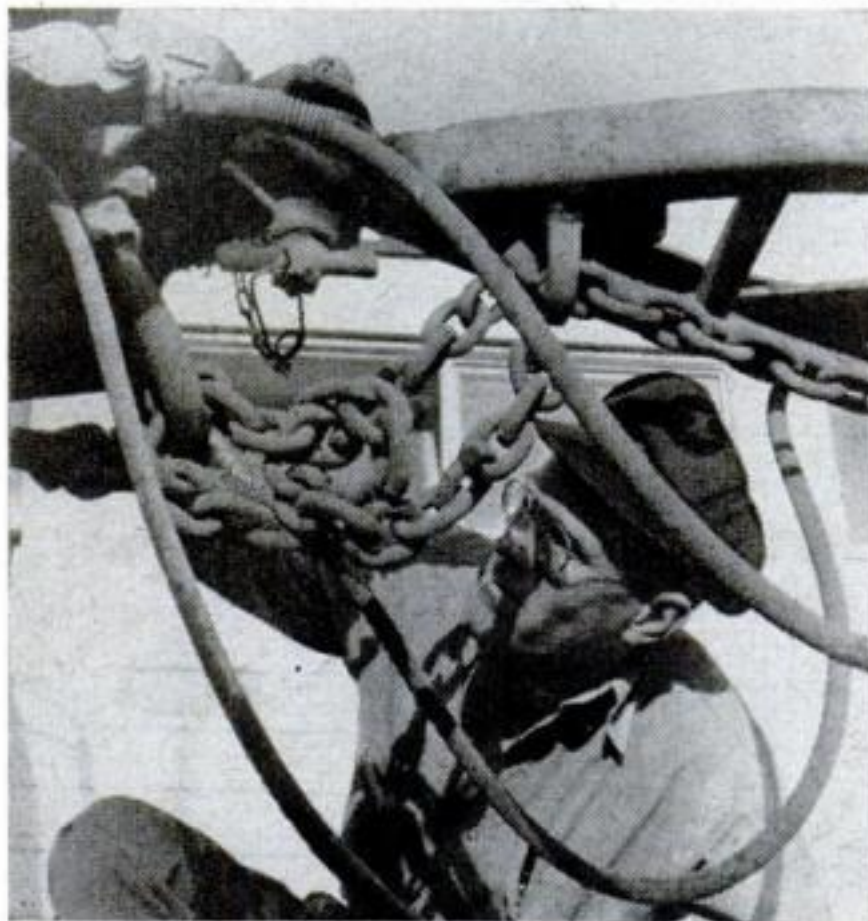
At each stop of highway freighter's cross-country trip, service-station attendant raps tires with an iron bar. The thud tells his experienced ear if pressure is up or down from normal 32 lb. On double wheels, this is easiest way to spot a flat—since either tire alone will support load. Some big "combos," carrying almost as much as a railroad car, have 22 tires. Heavy tire chains hang ready for use in mud or snow.



If a tire is flat, attendant uses this air-driven impact wrench to remove tight lug nuts. It jolts them loose, then unscrews them with successive raps. With such specialized tools, he can change one of these heavy-duty tires more quickly than you can pull a flat and put on the spare of your sedan. His fast work helps truckers keep up day-and-night schedules of close to 30 m.p.h., including all stops.



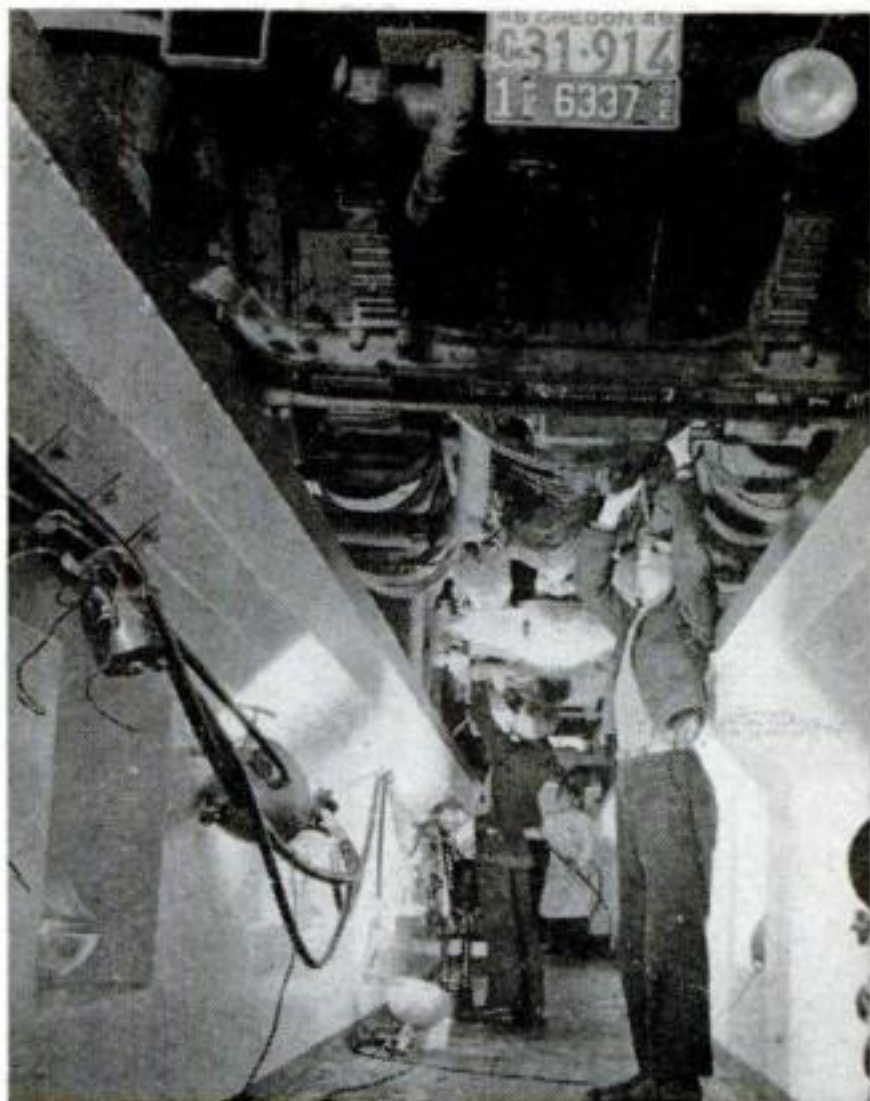
Attendant inside station weighs truck and its load on platform scale outside. Driver gets a copy of report to show inspectors who enforce widely varying state laws on size of highway transports. Biggest loads—43,000 lb.—are allowed in California, where a third of nation's truck-trailer combinations haul 3,000,000 tons of milk, 30,000,000 tons of other food a year.



Heavy-chain hitch stands ready to hold truck and trailer together if the regular coupling should snap. Hoses carry compressed air from cab to pneumatic brakes. Driver operates separate controls for truck and trailer brakes. Trailer-brake system carries heavier pressure, so it will take hold hardest and keep trailer from over-running truck on sudden stops.



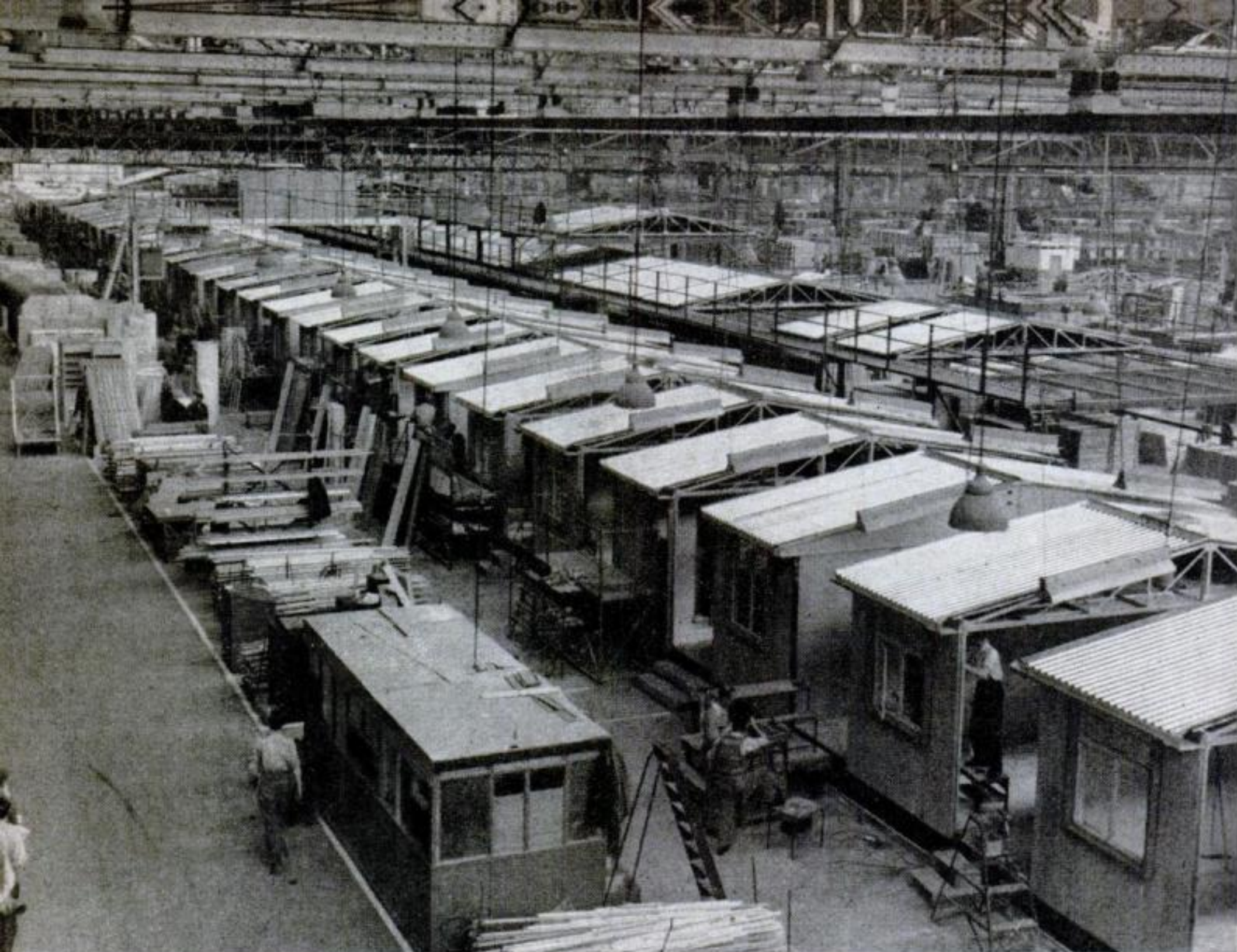
Steel arms of tire spreader, operated by pedal sticking out from base, hold beads apart while tube is removed. Either a hot or cold patch may be applied, and a few minutes later tire is ready to be put back on. A tire dolly, rolling on ball-bearing wheels, enables one man to lift 200-lb. wheel and tire from truck or trailer. In bad weather, he then trundles the entire unit into shelter of the station for repair.



Lubricating a big "combo" is a four-man job. This grease pit at a station in San Francisco is long enough to take four passenger cars. The war proved that, with proper care, trucks can run up terrific mileages. Diesels and butane burners get engines overhauled or replaced every 100,000 miles; some have gone 800,000 before they were ready for the junk heap. Break-in period for Diesels is 32,000 miles.



Driver makes out progress report on trip by truck licensed to operate from coast to coast.



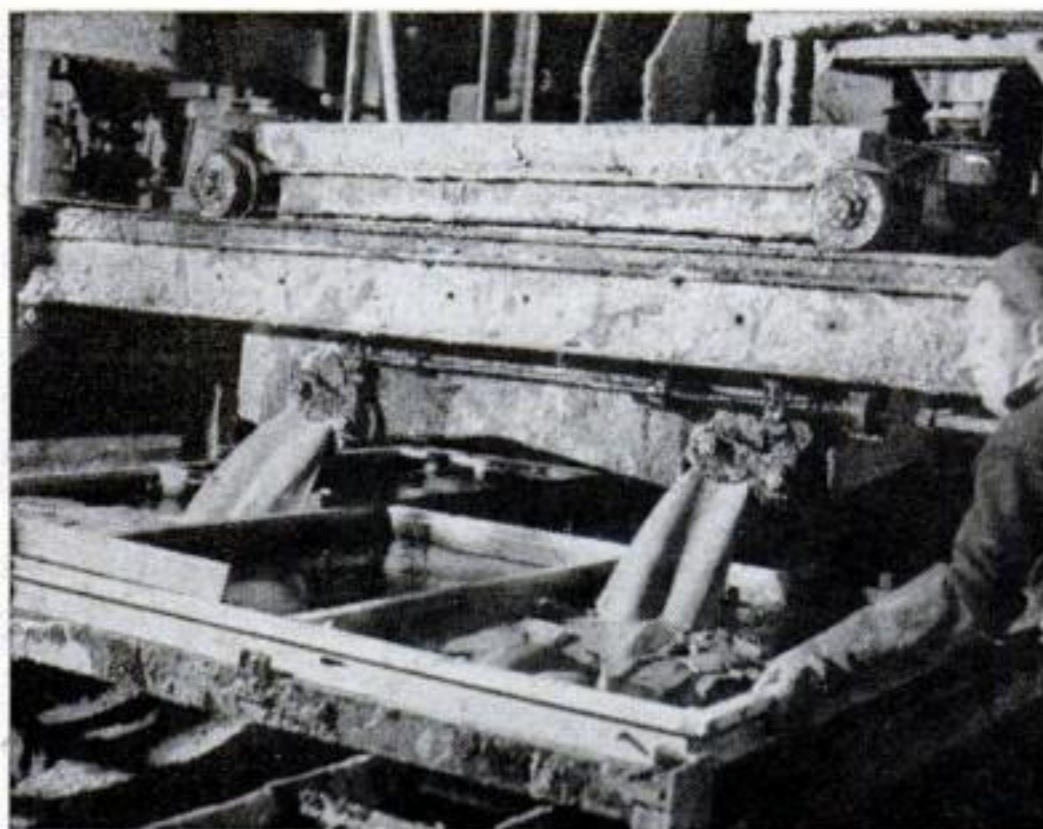
Production line at the Gloucestershire (England) factory of A. W. Hawksley, showing completed half houses. The prefabricated alumi-

num dwellings are constructed in sections, and then partially assembled in the plant. Note the line of roofs at right in the background.

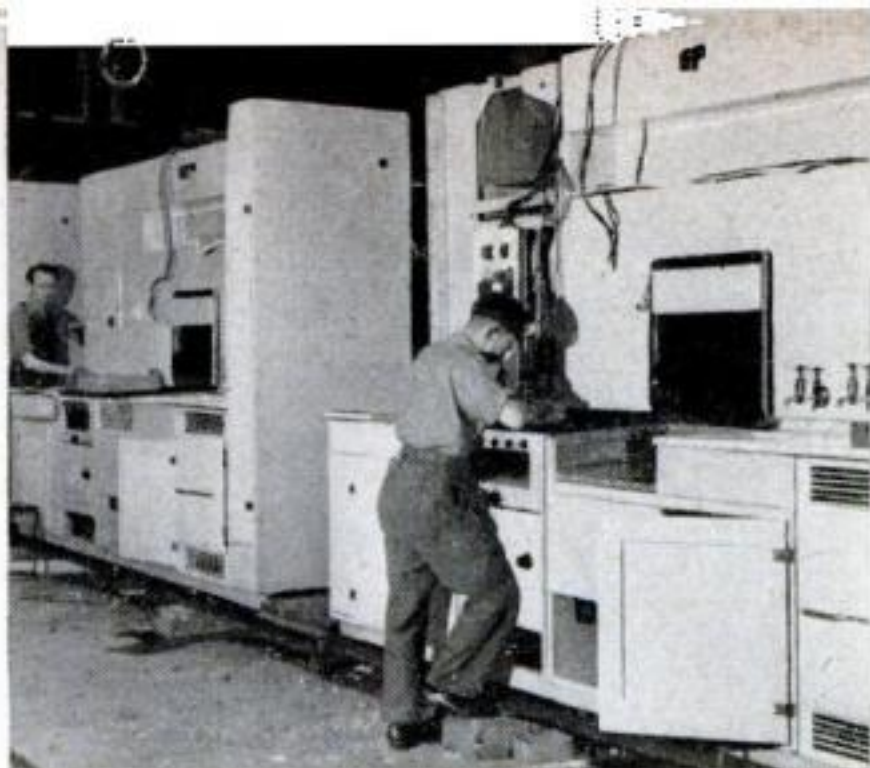
Britain Exports Houses in Halves

BY HELPING to solve the housing shortage for other countries, Britain hopes to ease her own dollar shortage. Modern mass-production methods and aircraft manufacturing facilities are being used to turn out prefabricated aluminum houses. Adopting wartime-speedup methods, 3,000 employees of the Hawker Aircraft Co. turn out a house every 15 minutes. South America, Australia, and India are among eager customers.

132 POPULAR SCIENCE



Built-up wall panel of a house is filled with a special aerated cement. Next step will take it to a drying oven. Roof sections are built up on typical aircraft-type jigs—the result of the firm's experience gained during the war. Many of the workmen are war veterans.



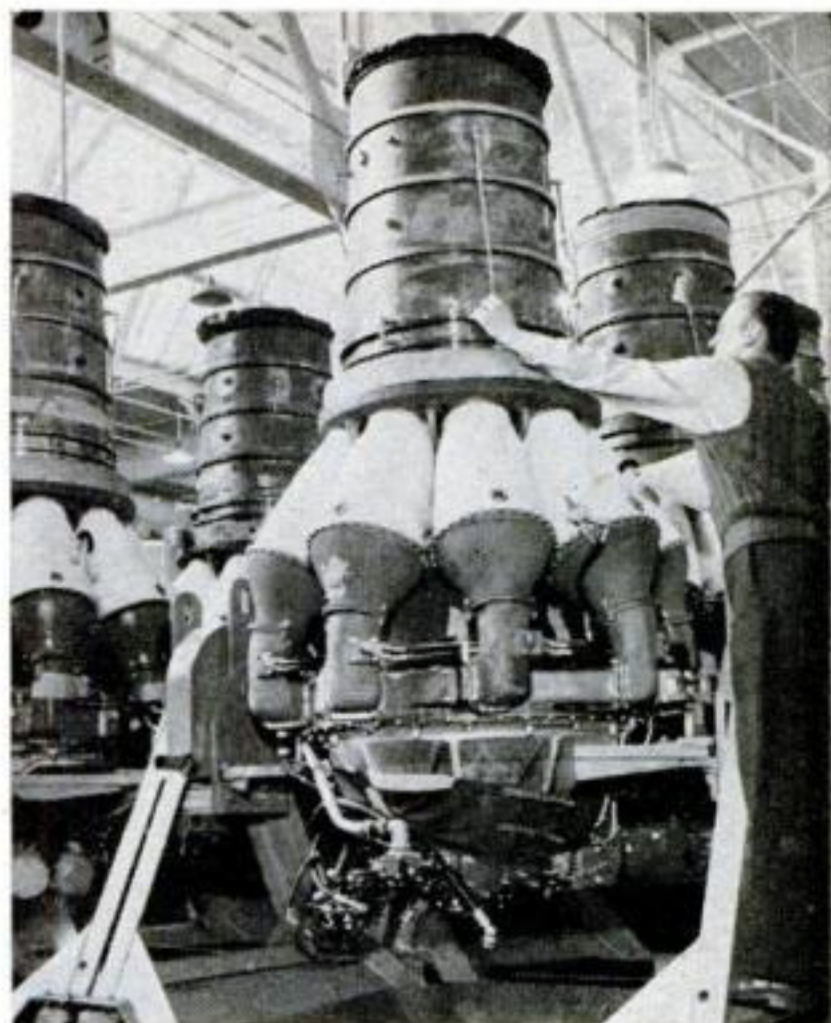
Along the production line, various sections of the houses are fitted with accessories. Men above are working on kitchen units. The houses are all-electric and have all modern conveniences, including refrigeration and bathrooms built right into the shell at the factory.



Finished half houses are loaded onto trucks in the factory and covered in preparation for shipment. Although Britain has her own housing shortage, the need for foreign exchange is greater, so these houses are earmarked for export. There is no shortage of customers.

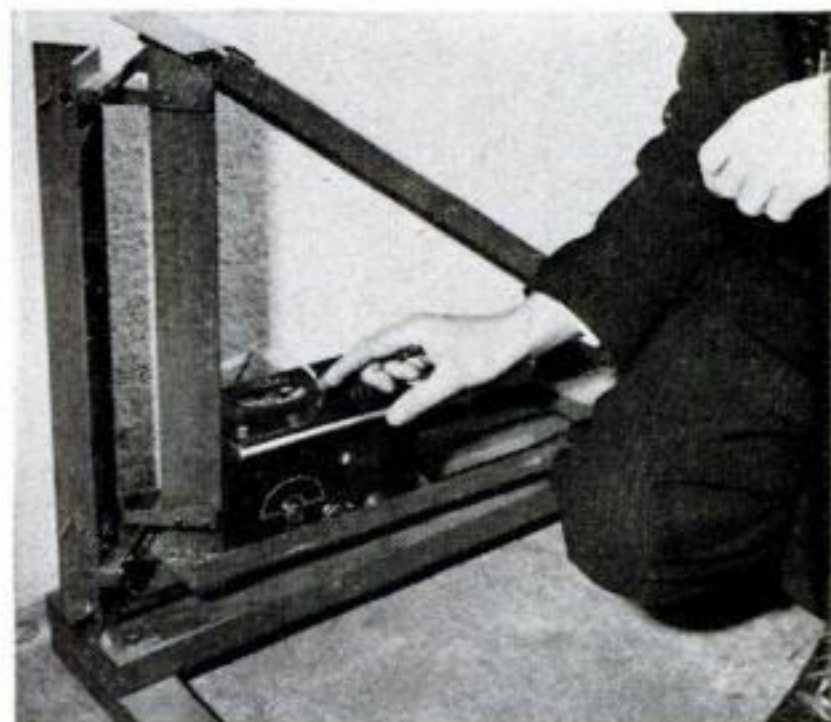


At the building site, erection of the house presents no problem. The two halves, one of which is shown above being put into place, can be locked together and be ready for occupancy in two hours. Even painting and complete interior finishing has been done at the factory.



More Power for Navy Jets

UPENDED for inspection, this new Pratt & Whitney Turbo-Wasp® is the most powerful jet engine produced in America. It is rated at 5,000 pounds of thrust, which, at speeds of more than 600 m.p.h., is the equivalent of 9,000 hp. First production models of the JT-6B will be installed in F9F-2 carrier-based fighters.



Meter Measures Vibrations

THE new portable "seismograph" above is being used to study how vibrating machinery shakes a factory wall. The device uses the principle of earthquake recorders. Set against the wall, a prod vibrates a Barry seismic pendulum. A Westinghouse Vibrograph® then records the vibrations on transparent plastic tape.

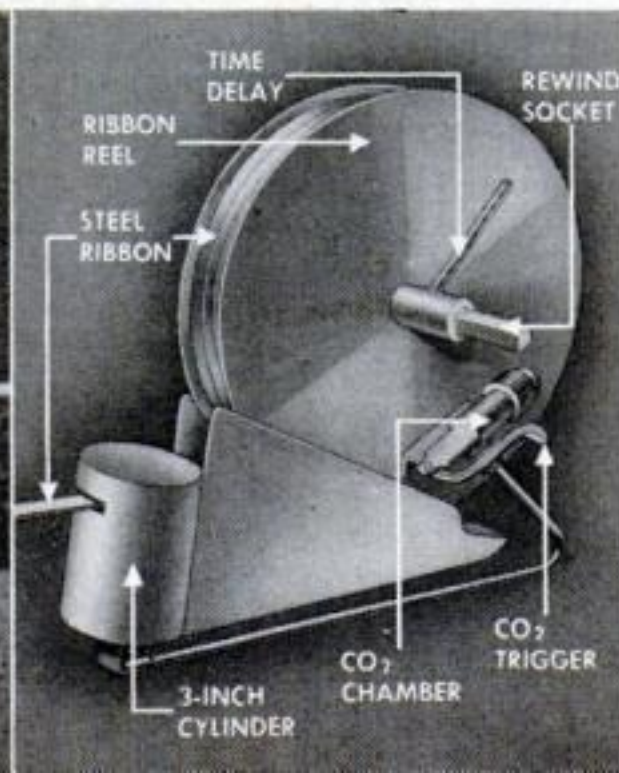
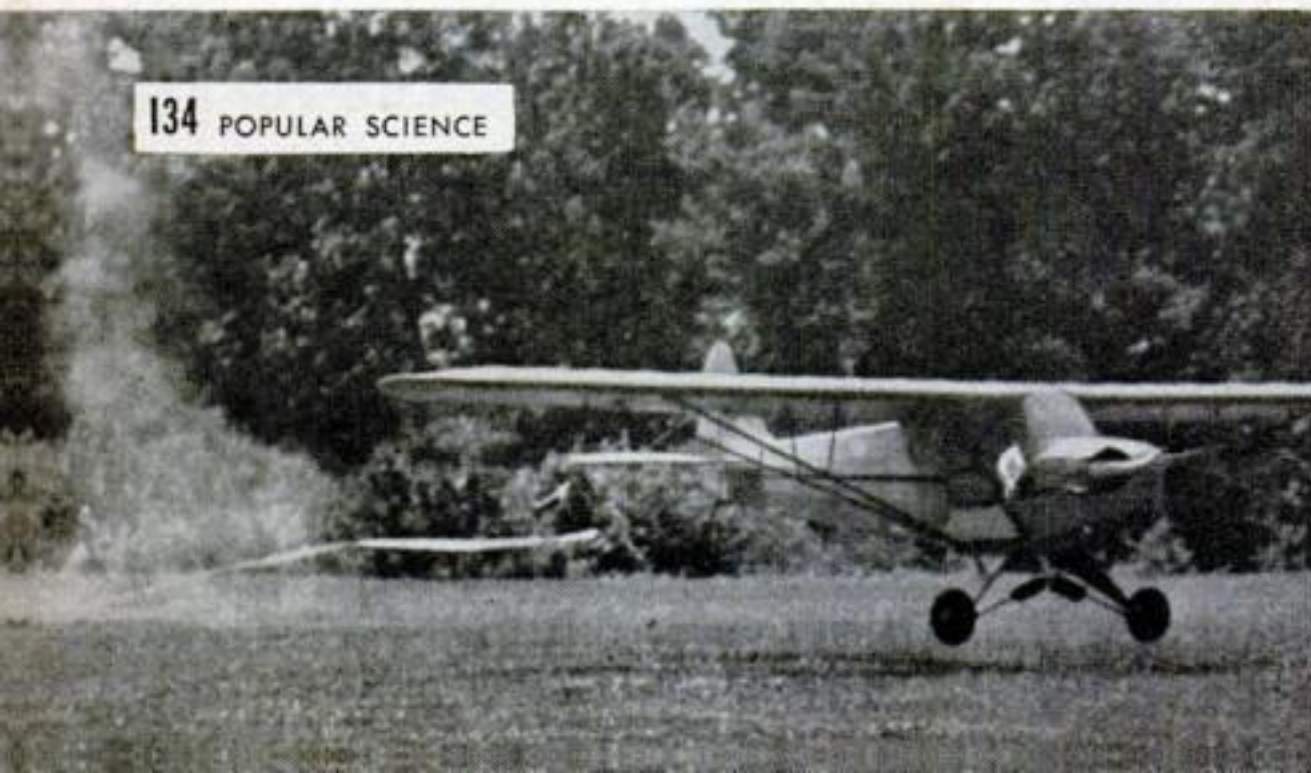


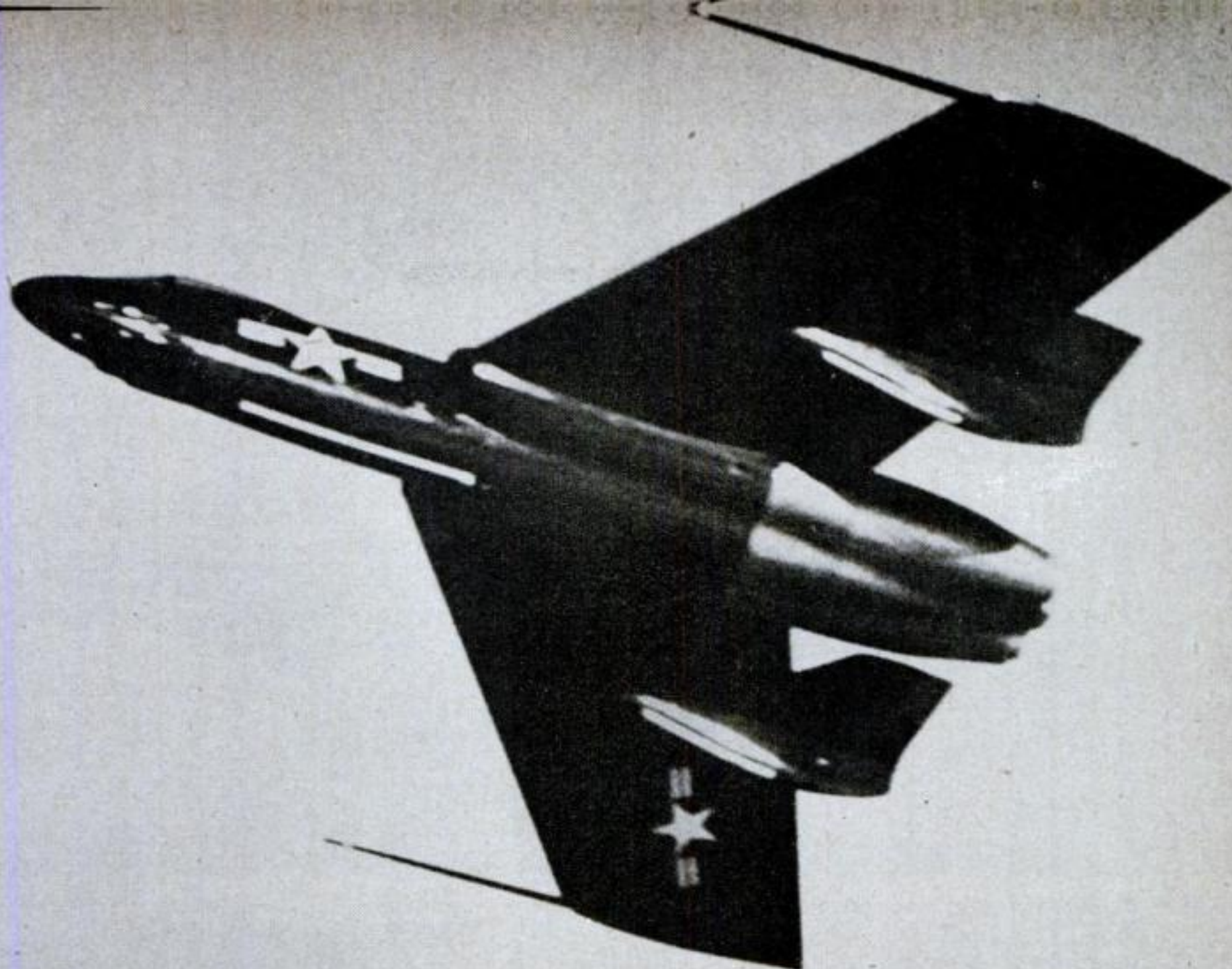
Flying Lying Down. This Air Force sergeant is trying out a "prone-position bed for pilots." A later model has been installed in the nose of a B-17 to test how this position will raise a pilot's "blackout threshold," permitting quicker maneuvers, sharper turns, and faster pull-outs. At left is a prone-piloted, experimental Northrop XF-79 jet fighter.



Brake Shot into Ground. The photo below, at left, shows how a new arresting anchor is shot into the ground from a plane about to land. Fired by a charge of gunpowder, the anchor pulls out a stainless steel ribbon that unreels through friction-brake shoes. Together, they bring a 1,200-lb. plane, landing at 70 m.p.h., to a

stop in a tenth of its normal 1,000-ft. ground roll. The 18-lb. mechanism, shown at right below, was developed by All American Airways, Inc., of Wilmington. Used here on a Piper Cub, it's adaptable to heavier planes. The brake shoes are applied by compressed CO₂. They can be small since most of the friction heat is carried off by the ribbon.



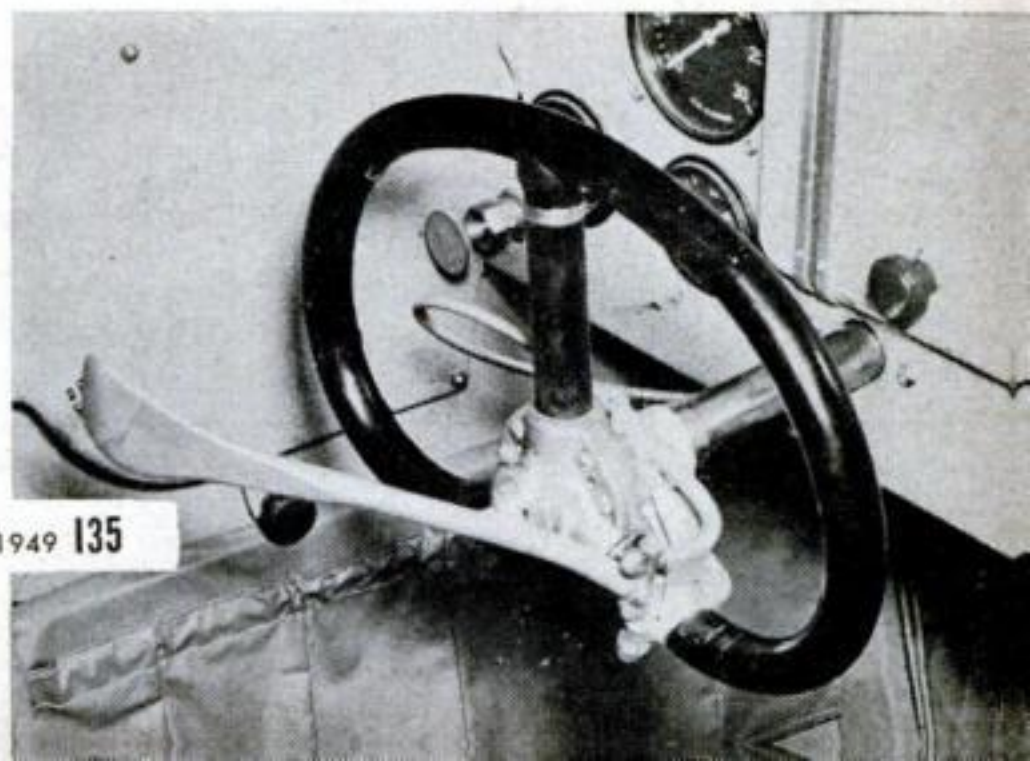
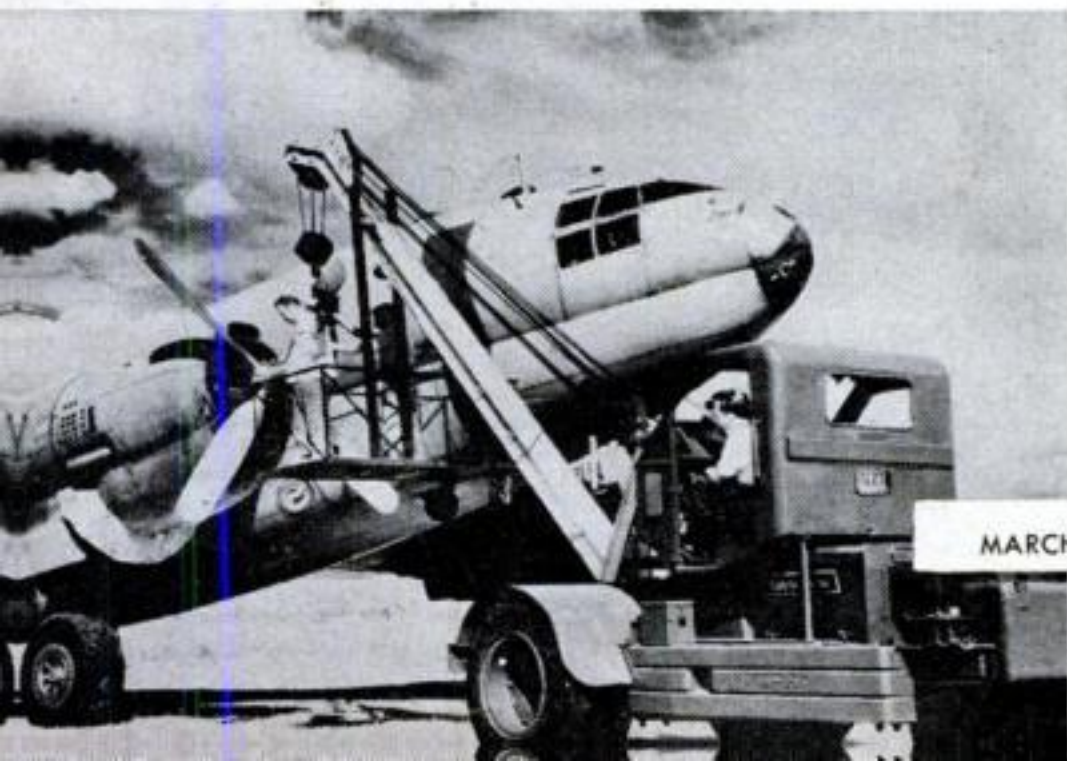


Tail-less Fighter Is Fast. This twin-turbojet fighter, designed for carrier operation, goes more than 600 m.p.h. It is the Navy's new Chance Vought XF7U-1. Two vertical stabilizers and rudders are in the trailing edge of the wing. The plane is turned both horizontally and vertically by a pair of "ailevators," combining the work

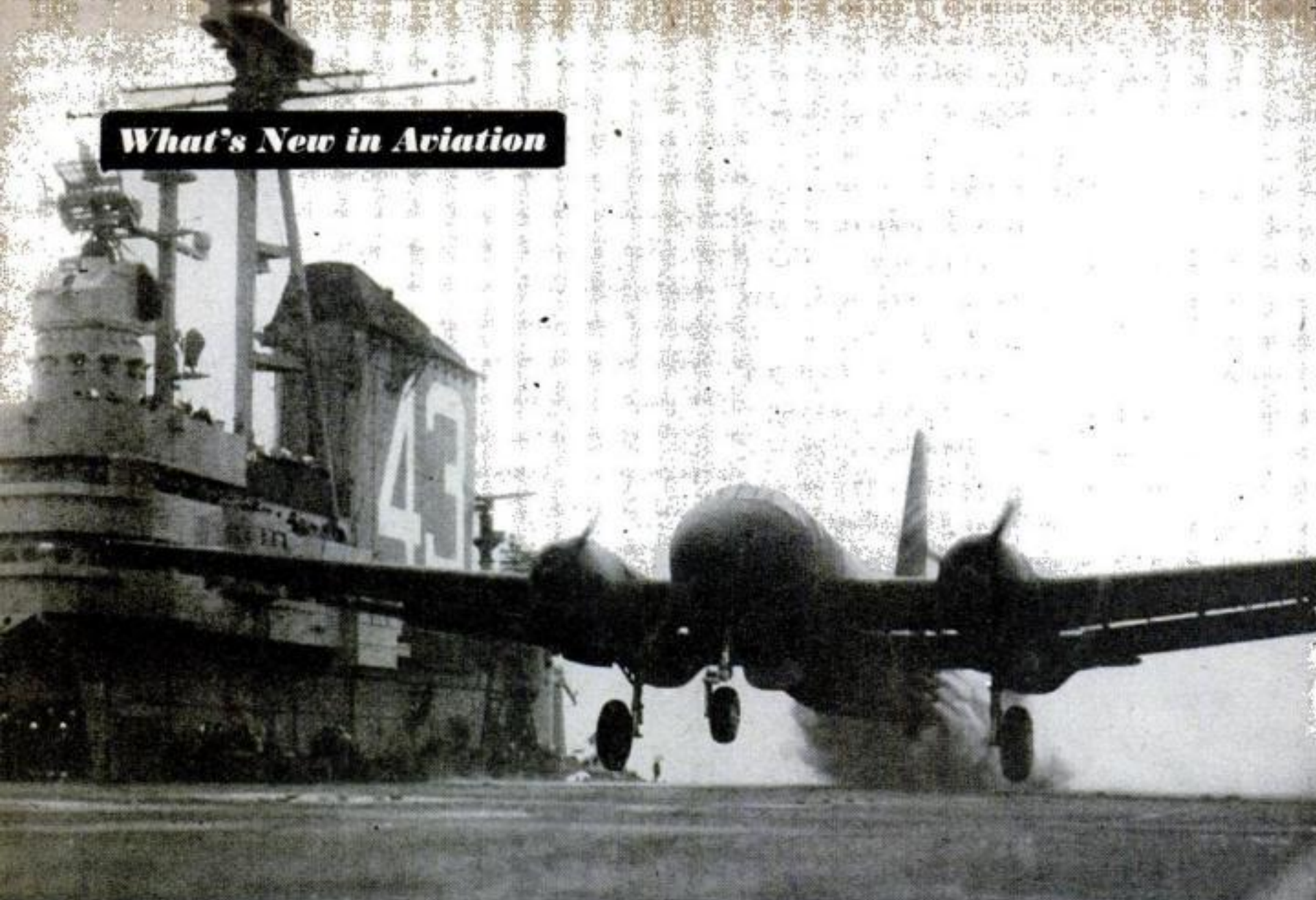
of ailerons and elevators. Leading-edge slats do the job of landing flaps. Hydraulic jacks operate all controls. In combat, bursts of high speed can be obtained through afterburners. The plane is kept light by a maximum use of magnesium. It has a pressurized cockpit and an ejectable pilot's seat for bailing out at high speeds.

Servicemen Get Airlift. Below, an ordinary crane truck puts into position a new kind of working platform for installation and maintenance of Hamilton Standard propellers. The boom can hoist the platform up to 26 feet, while the prop is raised or lowered by a cable. In transport, the platform is towed behind the truck.

Handle Replaces Foot Brake. Designed for handicapped pilots, the hand grip attached to the control wheel of this Ercoupe® (below) operates the brake and eliminates need to use the plane's only foot pedal. Made by the Grand Central Airport Co., of Glendale, Calif., it enables the plane to be flown entirely with the hands.



What's New in Aviation



Off in a Burst of Smoke. With a powerful jet-assisted kick, a Lockheed P2V Neptune, the largest plane ever to take off from a carrier, lifts its wheels from the deck of the *USS Coral Sea*. Two of the twin-

engine search-patrol planes were used in a recent successful test. Both were unmodified operational versions and, since neither was equipped for carrier landings, came down at a nearby Naval air station.

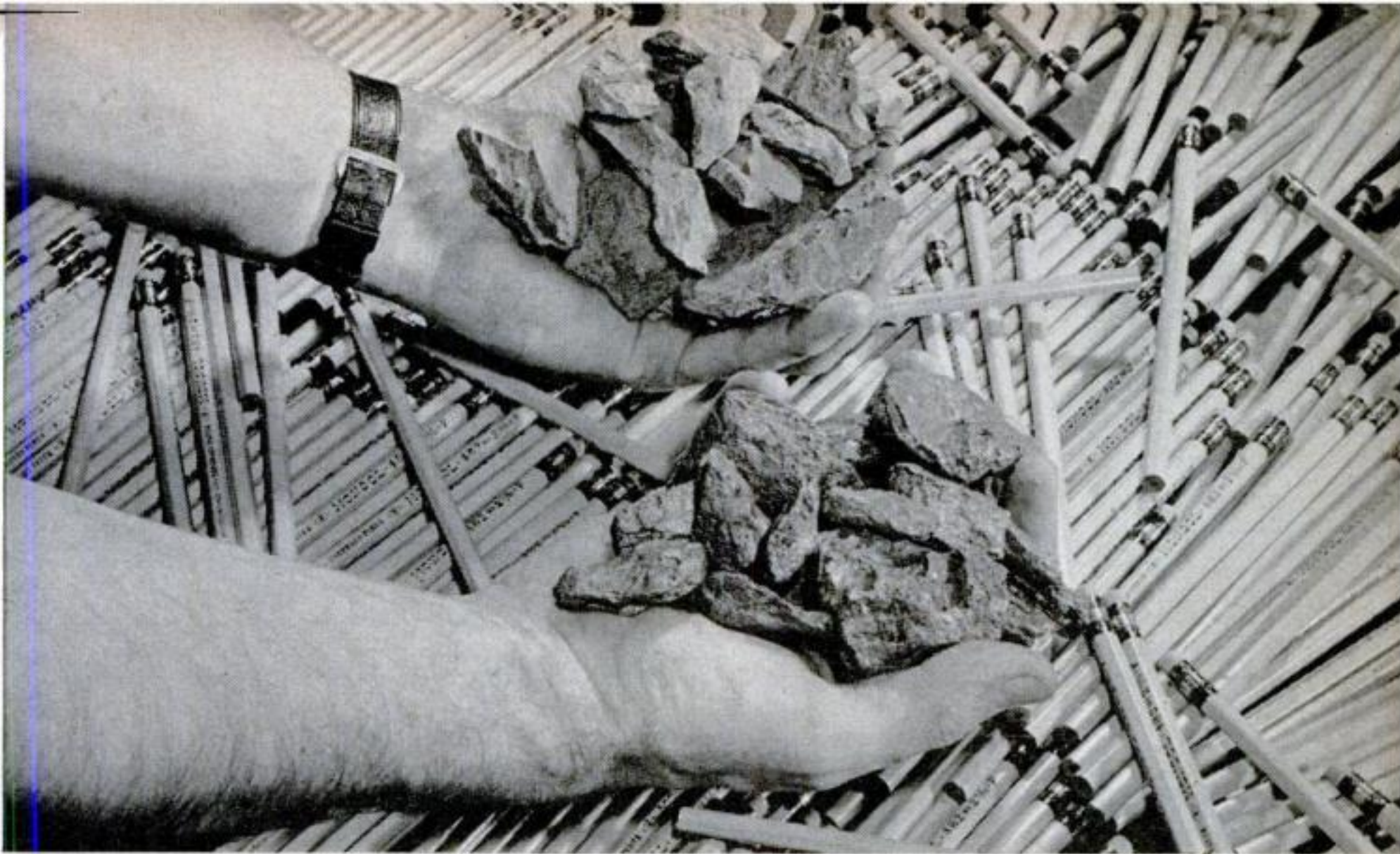
Aircraft Refueling Speeded Up. With a new Air Force continuous-flow fuel system, all tanks of the largest bomber can be refueled from the single point shown below. At present, the B-29 has 11 servicing points for its 29 fuel tanks. Using the new system, one man with one truck can do in 30 minutes a refueling job that previously took 13 men with four trucks 45 minutes. In flight, it provides a continuous flow of fuel from all tanks to all engines without the crew having to remember to switch tanks. The Air Materiel Command says present air-to-air refueling would be impossible without the new system.

Small Plane Has Twin Tail. Designers of the new pusher-type personal plane shown below say that mounting the tail on twin booms improves its performance by reducing drag through use of a shorter body. Now being test-flown by Anderson, Greenwood & Co. at Houston, Tex., the two-place plane is powered by a Continental C-90 engine mounted behind the cabin and connected directly to a pusher propeller. This arrangement gives both pilot and passenger unrestricted vision and is said to cut cabin noise. The all-metal plane has a steerable tricycle landing gear. Top speed is 120 m.p.h.; range is over 400 miles.



136 POPULAR SCIENCE





Raw materials for pencil lead: clay (top) and graphite. Wood is soft, straight-grained cedar.

Pencils Made By the Billion

PS photos by Hubert Lockett

THAT pencil in your pocket is one of more than a billion made in the U.S. each year by a highly mechanized process that is surprisingly complicated for so simple a product. The materials come from the mines and forests of four continents.

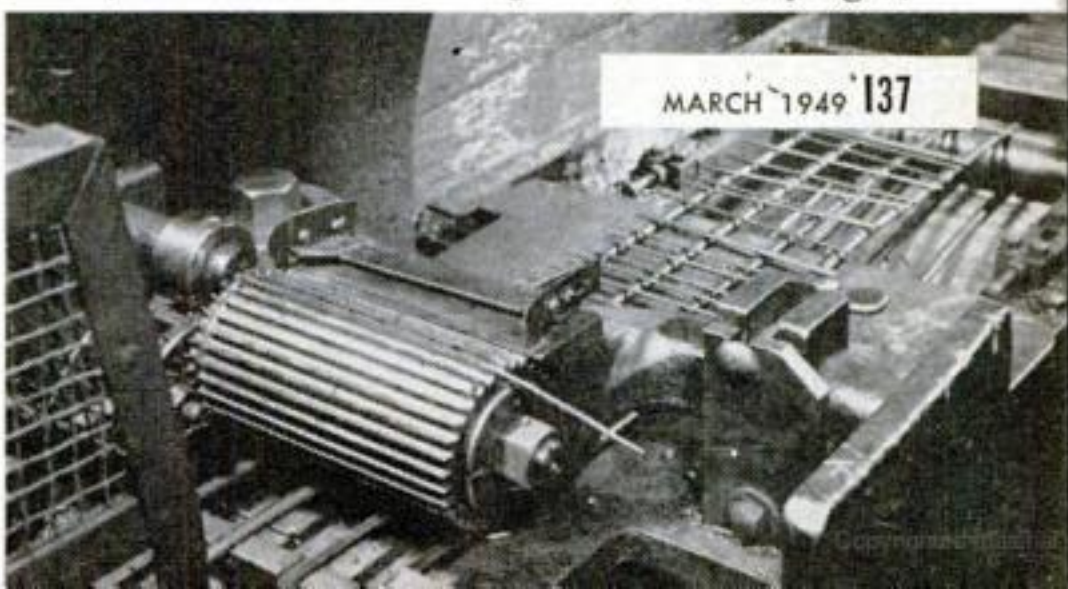
The business part of any pencil, its lead, is graphite fused with clay. The percentage of clay determines its hardness. For soft grease pencils, wax is added. The softer the lead, usually, the bigger its diameter—to keep it from breaking. Colored leads contain dyes and a filler that is a secret with each manufacturer.

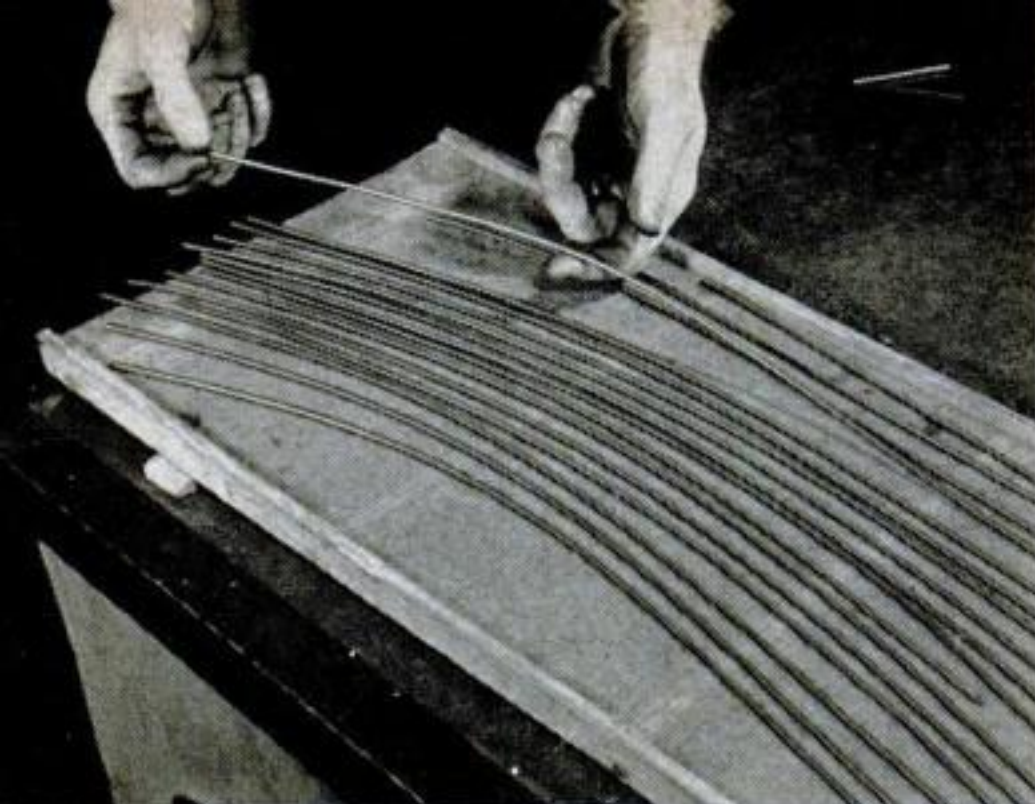
In the Brooklyn factory where these pictures were taken, the 100-year-old Eberhard Faber Pencil Co. can turn out 860,000 pencils in an eight-hour day. They come in more than 1,000 types and 70 tints—including women's eyebrow pencils.



Mixture of graphite and clay is put through series of mechanical and chemical processes to refine and pulverize it. Here pellets are being milled to give lead finer consistency.

Extruding machine (below) presses compound through a die to make long, slim lead. Receiving roller cuts off sections. These ride conveyor into heat-treating unit for drying.





Uncut leads, fresh from extruding machine, are fragile yet—as you can see in this picture—limber. Before being cut to pencil length and hardened, they are straightened by rolling.



Bunches of leads are wrapped in a special paper and put into crucibles for firing. Charcoal is sifted around them on agitator table as packing to prevent their warping under heat.



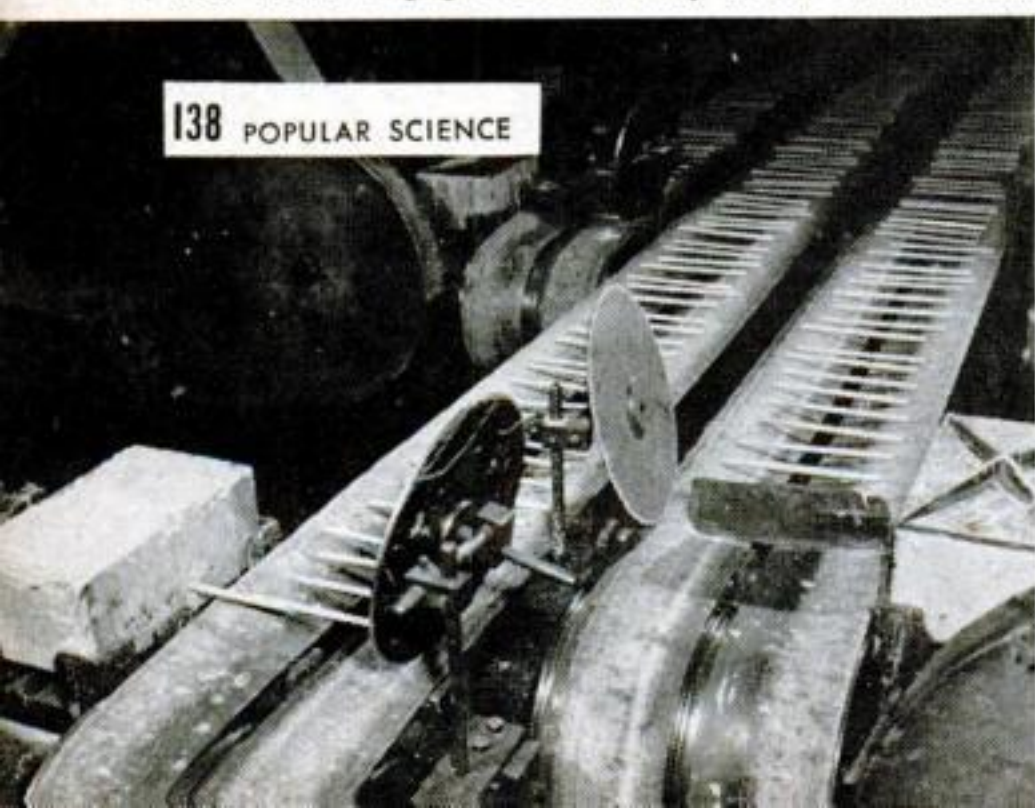
Leads are laid in grooves of slat by hand or machine. Glue is then spread on face of the slat, and a similarly grooved top slat is pressed on to enclose the leads in a sandwich.

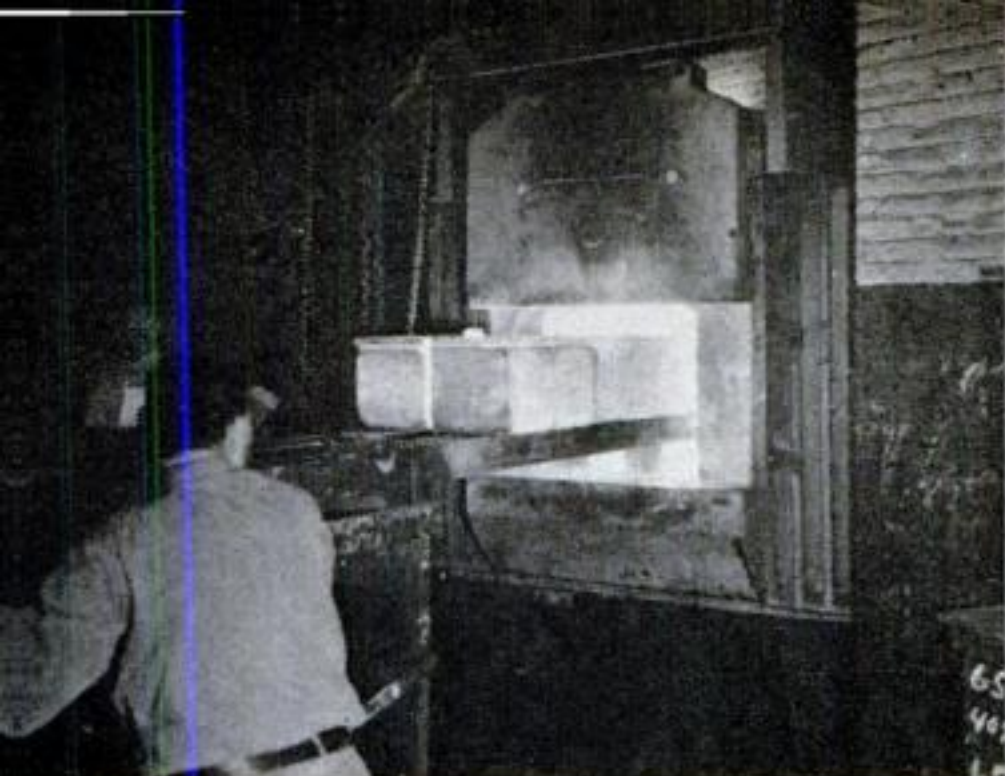


Cutting machine, operating at 15,000 r.p.m., slices up slats at rate of 130,000 pencils a day. It also shapes pencils round or hexagonal. Operator here holds a slat and cut pencils.

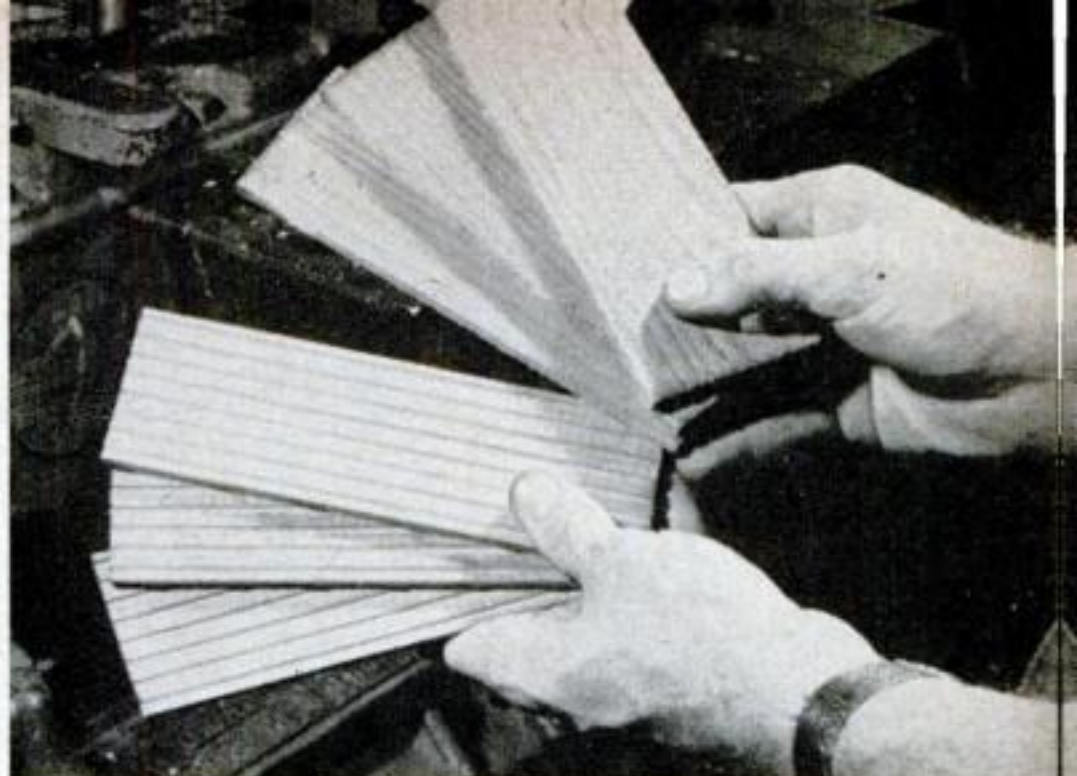
Rough pencils are coated 5 to 15 times by shoving them through reservoirs of lacquer (below) onto drying belts. Circular plates beside belts stop pencils as they shoot from baths.

In factory laboratory, leads taken from production line are ground down on this turntable (below) to determine their wearing qualities. Another machine tests leads for strength.

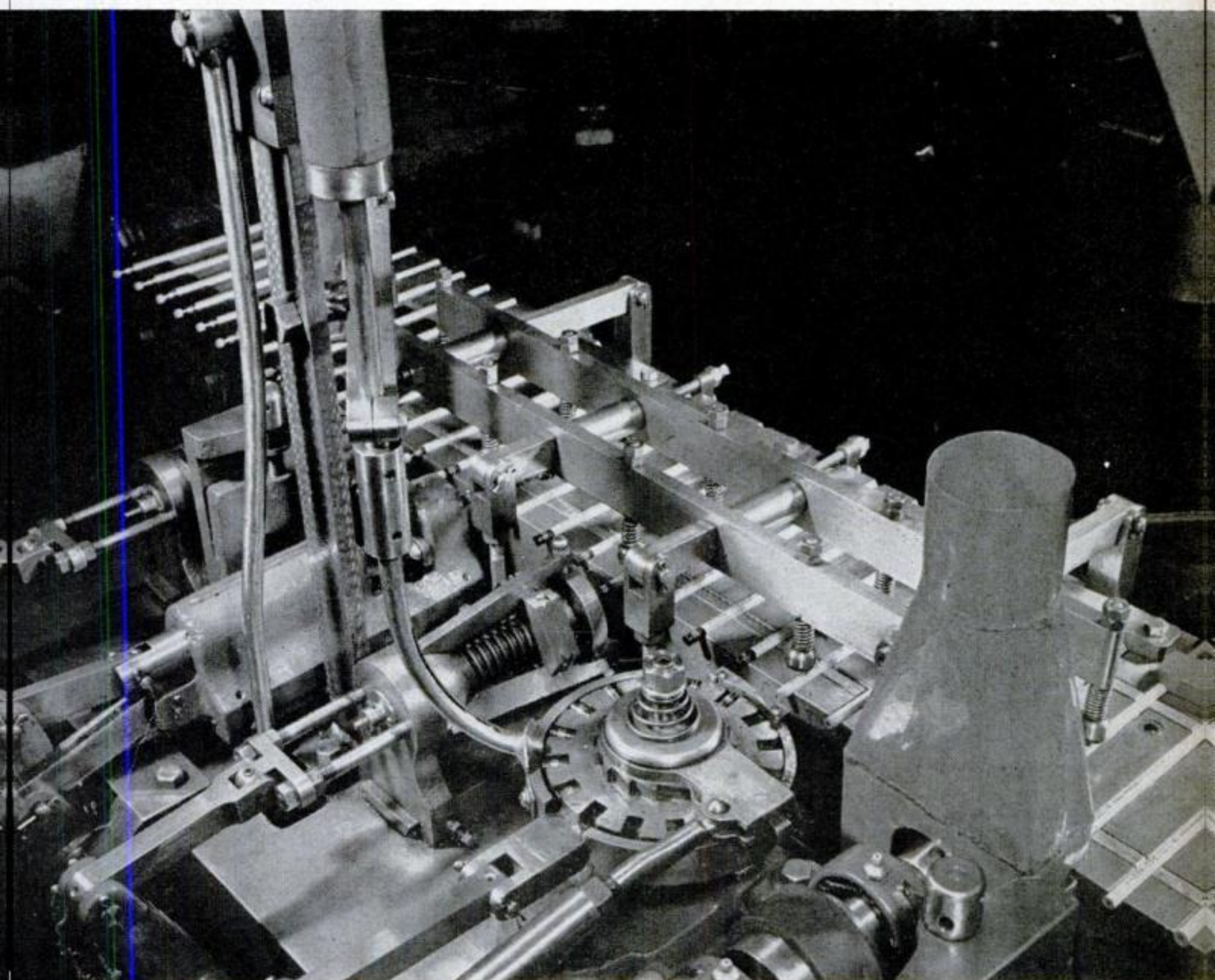




Firing takes four to eight hours, depending on the type of lead being made. Heat is maintained at 1,750° to 2,200° F. in gas furnace. This strengthens lead by fusing graphite and clay.



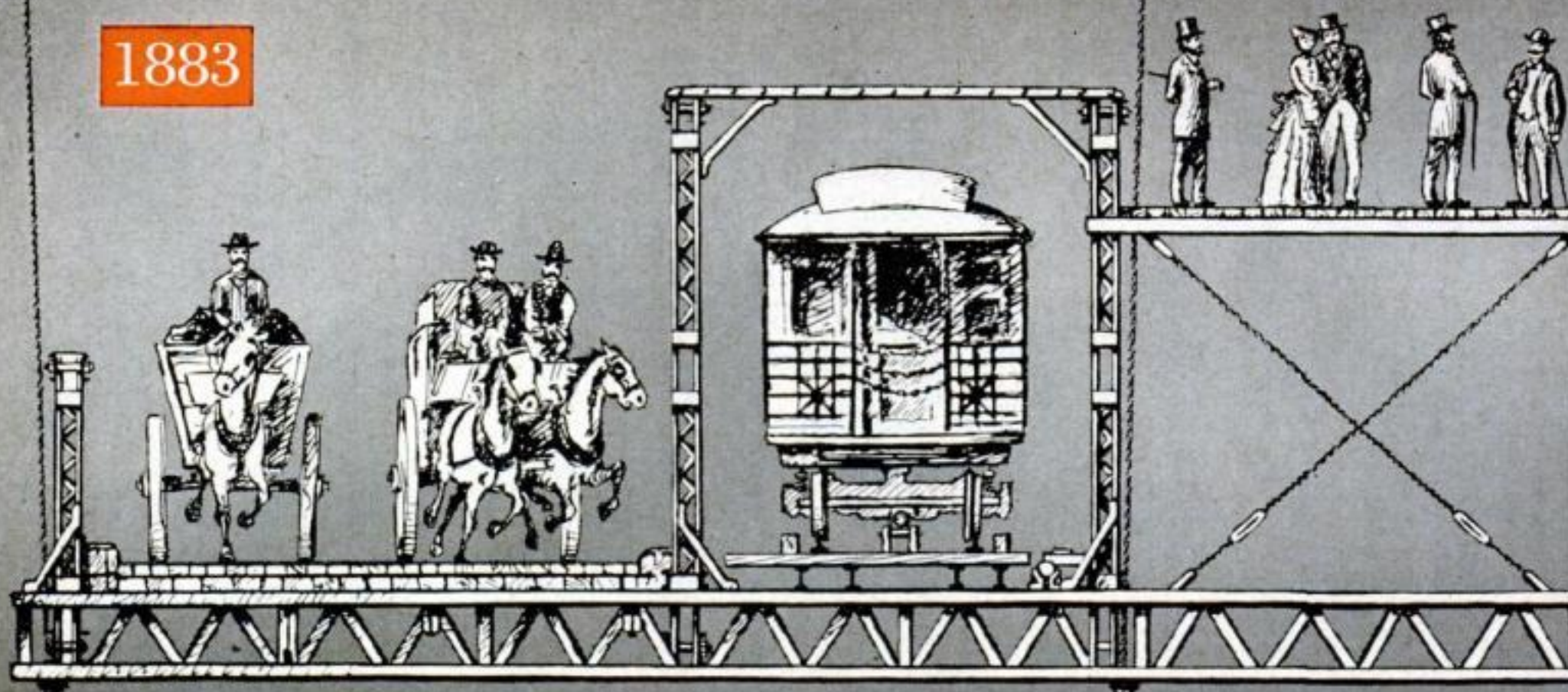
Wood sheaths for lead are made of slats half the finished thickness of pencils. These are grooved five to eight times, to a depth of half the diameter of the lead to be inserted.



To finish pencils, after they have been printed with trade-mark and type identification, this single machine performs five operations. It

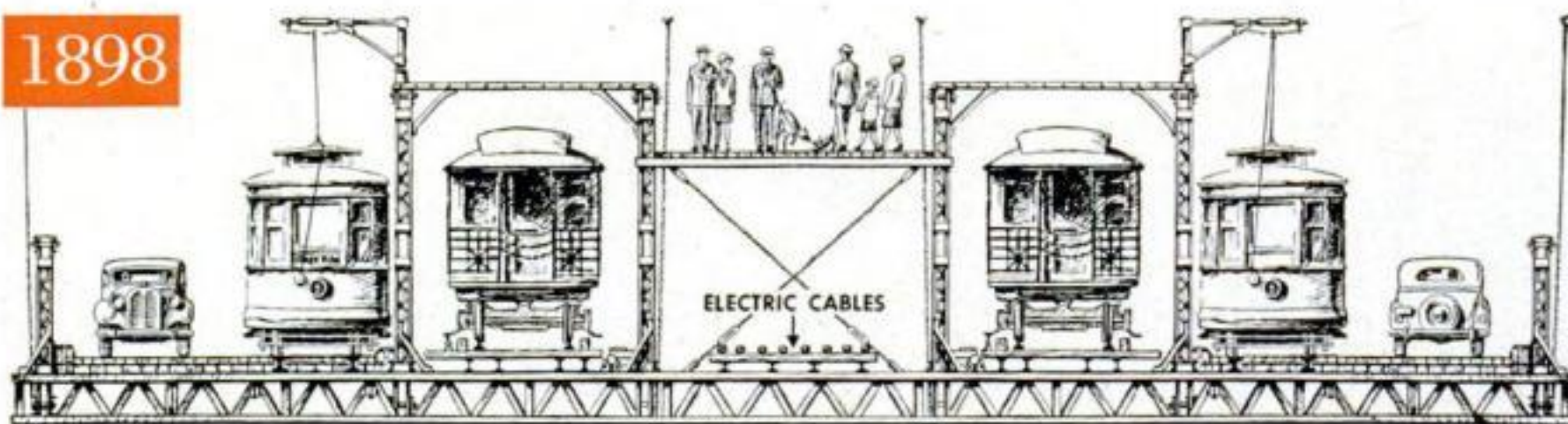
cuts a shoulder on one end of each pencil, presses on a metal cap or ferrule, clinches it, then inserts eraser and clinches that.

1883



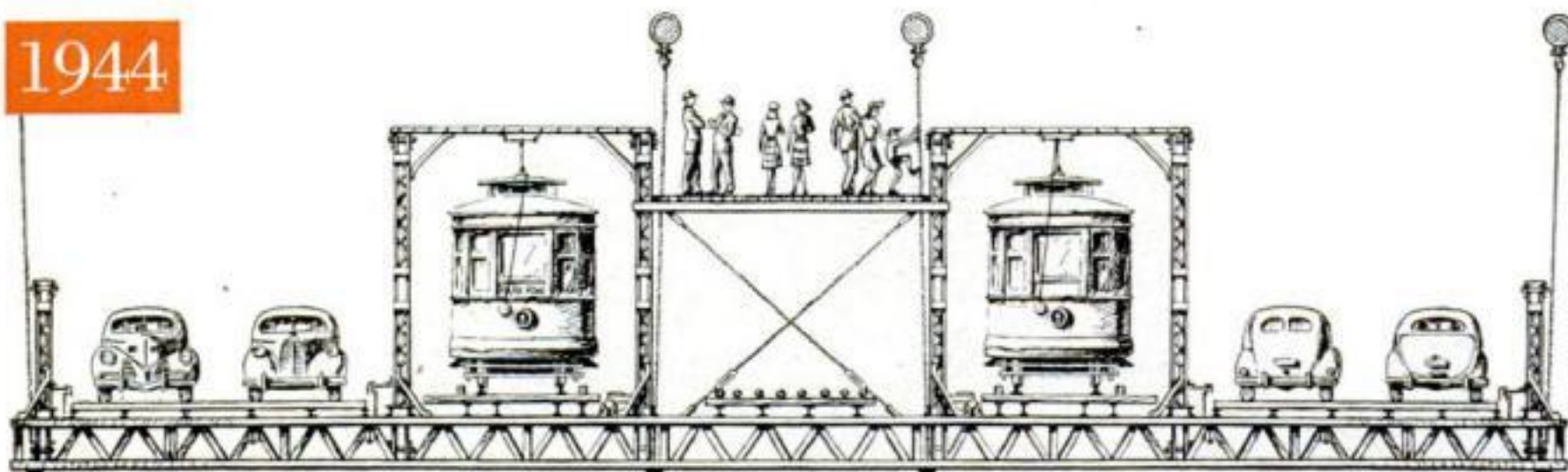
Cable cars and, in off hours, steam trains originally shared Brooklyn Bridge (photo inset)

1898



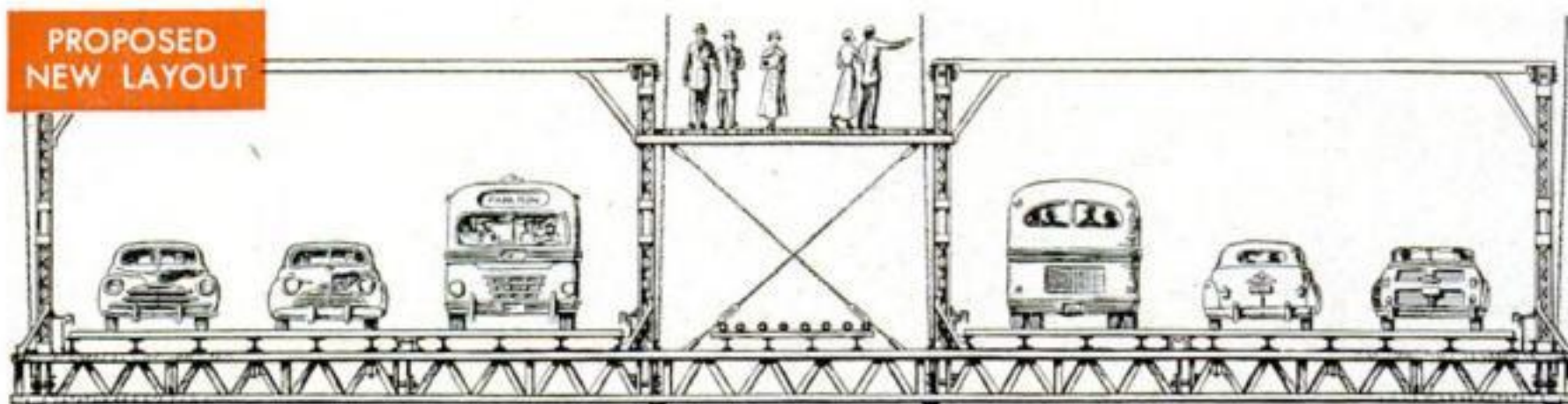
Era of electrification brought "El" trains, and trolley tracks were laid in the roadways.

1944

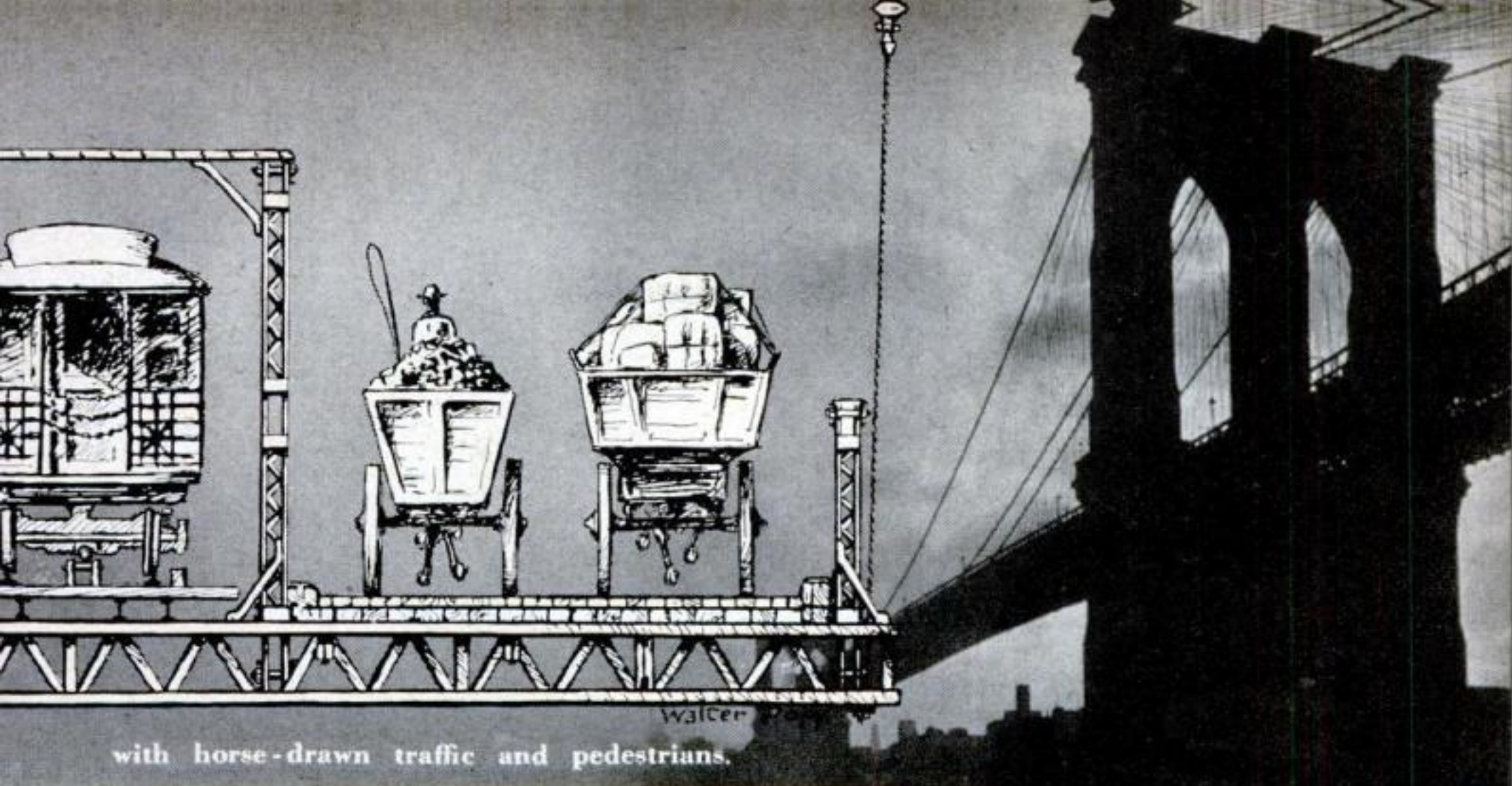


To give motor traffic more room, trolleys now use tracks of "El" lines, discontinued in 1944.

PROPOSED
NEW LAYOUT



Modernization will provide three-lane motor highways. Note major change in truss design.



with horse-drawn traffic and pedestrians.

Bridge Spans Changing Eras

By W. Mack Angus

BROOKLYN BRIDGE, first of America's great suspension bridges, is about to be modernized.

Remodeling the vehicular deck of New York's historic East River span between downtown Manhattan and Brooklyn will permit a three-lane stream of automobiles and buses to flow in each direction on widened roadways flanking the raised pedestrian walkway. Motor vehicles will then take exclusive possession of a thoroughfare whose traffic has been a pageant of passing eras—horse-drawn carriages and carts, cable cars, steam trains, elevated trains, and trolleys.

Outwardly the appearance of picturesque Brooklyn Bridge, a landmark of New York harbor that predates the Statue of Liberty, will remain virtually unchanged. Structurally, revamping the 65-year-old span will be a major operation. It will follow plans prepared under the direction of Dr. Frederick H. Zurmuhlen, New York City's Commissioner of Public Works, by Dr. David B. Steinman, authority on suspension bridges.

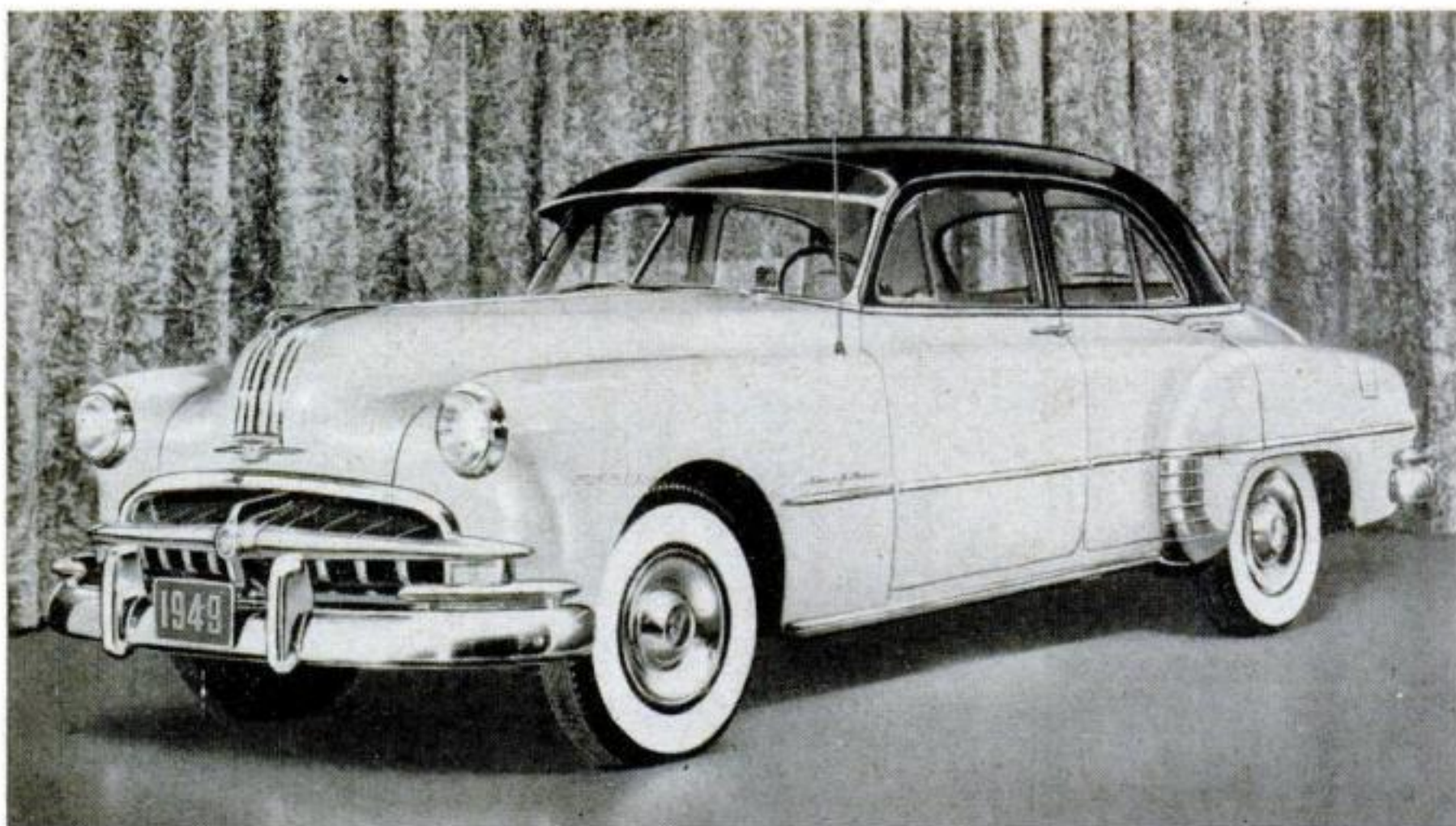
Deep, strong stiffening trusses will be constructed at the outer edges of the roadways to replace present shallow ones. This will permit removal of deep stiffening trusses

that now separate the roadways from trolley tracks. The trolleys will be banished, their tracks taken up, and the highway pavement extended over the space they now occupy. Approaches will be widened correspondingly and connected with express highways.

The work will start, at latest, as soon as completion of the new Brooklyn-Battery vehicular tunnel permits diverting bridge traffic to it. The project may be gotten under way even earlier by closing one roadway of the bridge at a time.

These alterations will adapt to mid-Twentieth Century needs a bridge whose construction—a 13-year task—began in the horse-and-buggy era of President Ulysses S. Grant. Press and public hailed the Brooklyn Bridge as the "Eighth Wonder of the World" when it was opened to traffic in 1883. Today the sturdy old span, designed by John A. Roebling and his son, Col. Washington Roebling, has proved a true wonder of planning ahead of their time. Illustrations on the opposite page show how, with only superficial changes, it has served the needs of succeeding generations. A detailed examination in 1943 showed its stone masonry towers, their foundations, and the four 15½-inch steel suspension cables still in first-class condition.

END

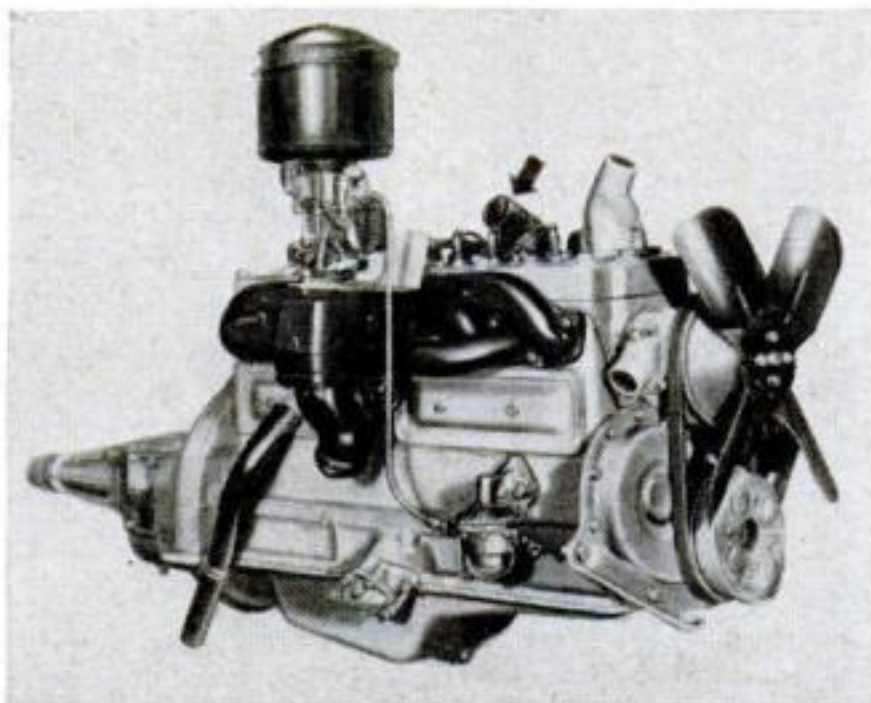


Snappy styling, better vision distinguish new Pontiac. Hood is lower, window posts thinner.

New Pontiac Is TV-Conscious, Too

THE new 1949 Pontiac aims to please television fans as well as car owners. Its ignition system, as shown at right, is specially designed to minimize TV interference.

Both of the new Pontiac series, the turtle-back Chieftain® (above) and the slope-back Streamliner®, have 120-in. wheelbases. Front and rear seats are wider and farther forward for greater riding comfort. The steering column is two inches farther to the left, giving the driver more elbow room. A plastic lens magnifies the speedometer numerals to twice their size. Front doors are six inches wider, rear doors nine inches wider. Window area is increased 38 percent.



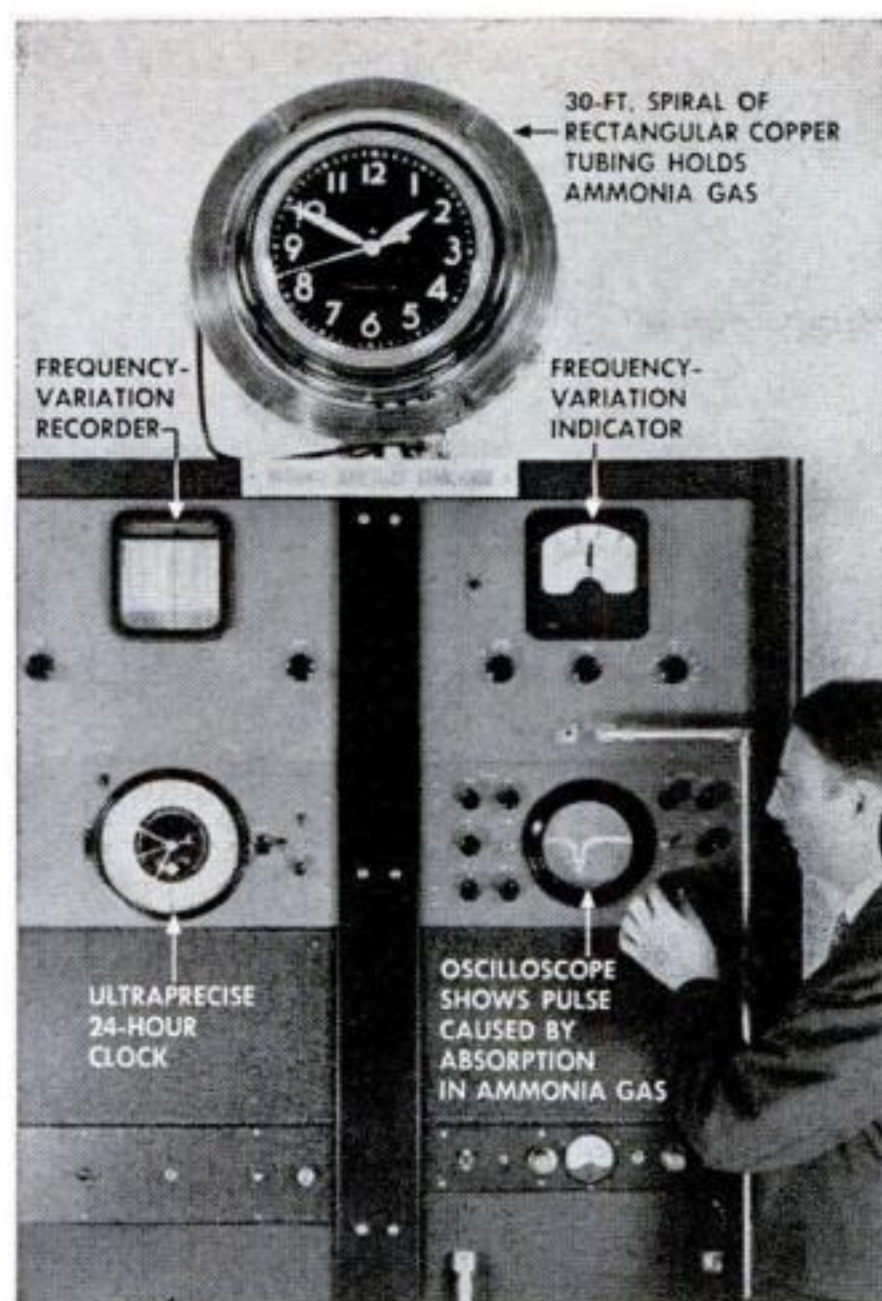
Placing spark coil atop engine (arrow) shortens high-voltage leads 75%, minimizing chances of TV interference. Lower-pitch fan blades cut high-speed noise. Engine can be six or eight.



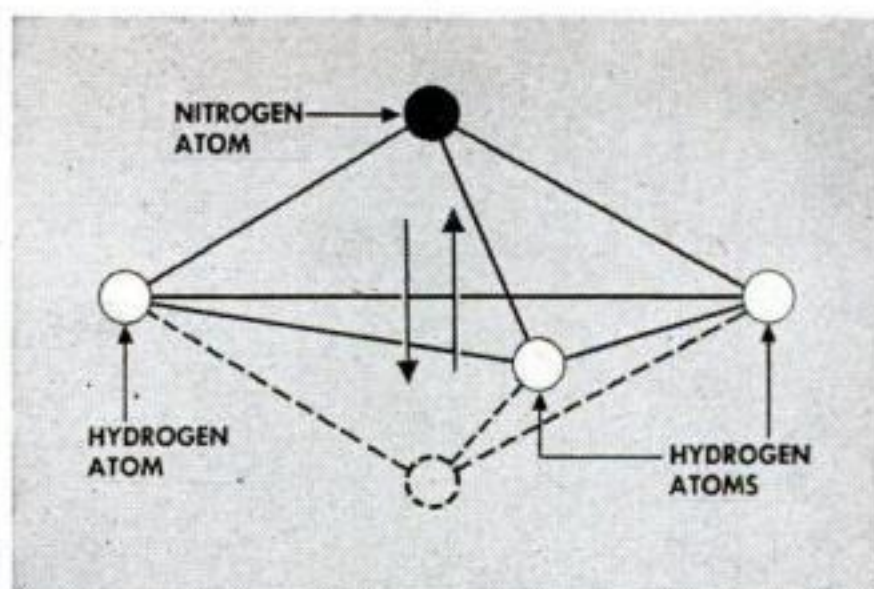
Slide Rule Rims Wrist Watch

THIS new Swiss calculating wrist watch, the Juvenia Arithmo®, is designed so you can use its slide rule without craning your neck. All numbers are read right side up.

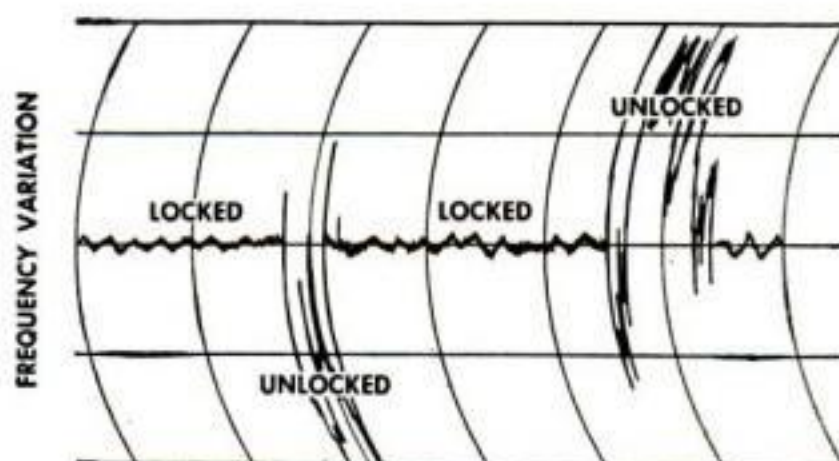
Two fixed inner scales, for multiplication and division, and a movable outer scale circle the dial. To solve a problem, the first figure, on the outer scale, is lined up at 12 o'clock with a transparent pointer. Scale and pointer are then moved together counterclockwise until the pointer lines up with the second figure on one of the inner scales. The answer is then found at 12 o'clock.



Steady vibrations of molecules of ammonia, in tubing wound around clock face, continuously correct oscillations of quartz crystal that controls speed of synchronous motor driving clock.



Sketch of ammonia molecule shows how it ticks time. Nitrogen atom jumps up and down, turning pyramid-shaped molecule inside out, when fed energy at frequency of 23,870.4 mc.



Frequency-deviation record of six-hour test run shows narrow variation in clock's speed when paced by ammonia molecule and wider deviations when running without that control.

Atoms Run New Superclock

AMMONIA—the stuff housewives use to clean windows—now keeps time. It is used in a new kind of clock, the first ever to make time-keeping independent of astronomical observations. Developed by the National Bureau of Standards, this clock is expected to help astronomers, navigators, and radio engineers.

The rotation of the earth has been the time standard for centuries. But the earth doesn't always turn at the same speed.

The new clock uses the ammonia molecule's vibrations as its standard. It compares those vibrations to the ticks of a quartz crystal, and adjusts the crystal so that it always ticks with the ammonia molecule. The crystal, in turn, controls an electric clock by changing DC to AC, whose exactly regulated cycles run the clock with extreme accuracy.

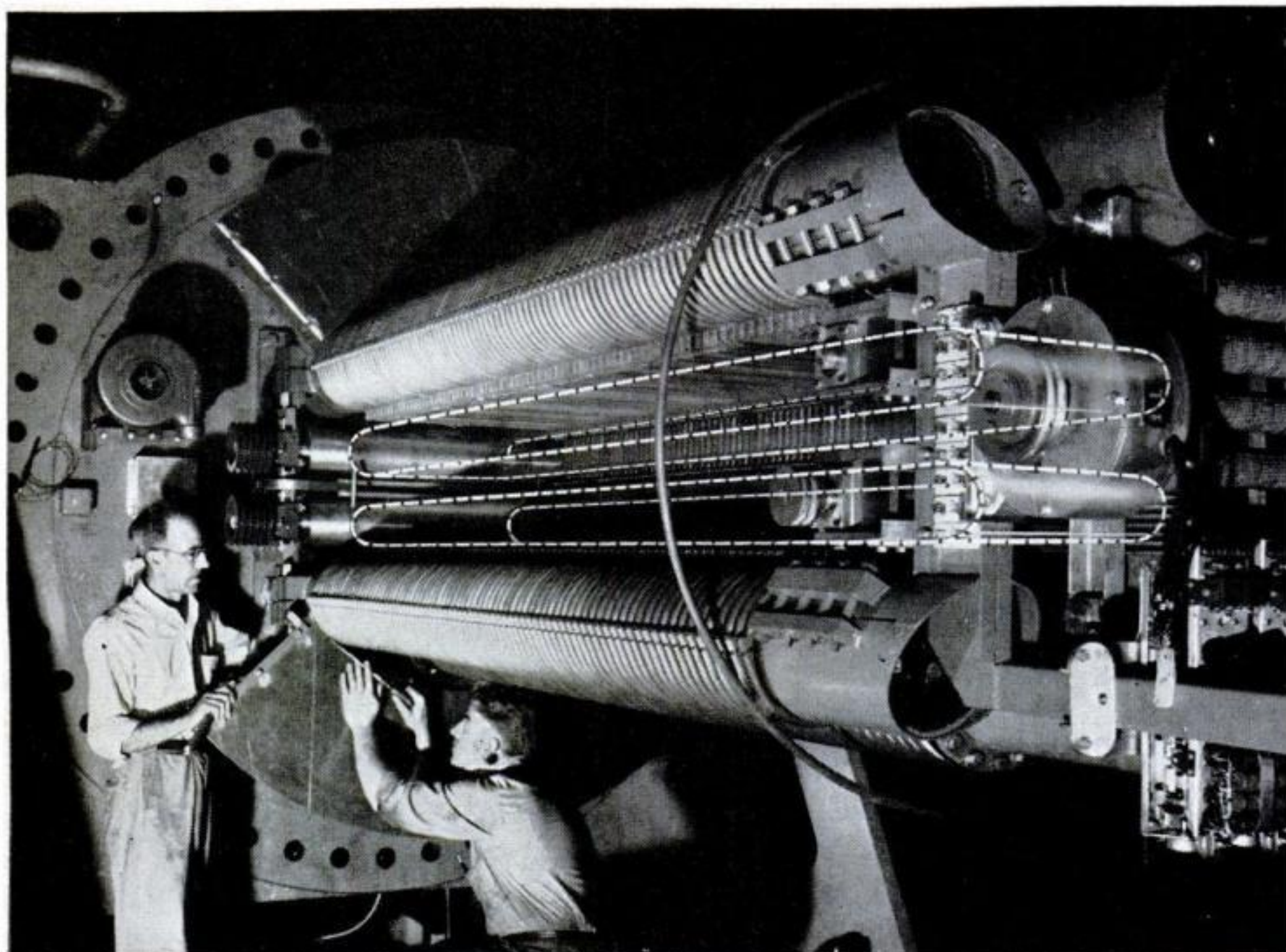
All molecules and atoms vibrate, like ammonia, at some particular frequency. Each gets the energy for its vibrations by absorbing energy of a given frequency. In

the case of the ammonia molecule, the vibration and absorption occur when energy is fed in at 23,870.4 megacycles.

Microwaves generated by the quartz crystal enter one end of a 30-ft. tube filled with ammonia gas. As long as the microwaves are exactly at 23,870.4 megacycles, most of them are absorbed by the gas. When the crystal gets off the beat, however, more microwaves get through the ammonia to a detector at the other end of the tube. The detector then signals an electronic frequency discriminator, which brings the crystal back into tune with the ammonia.

Yet even ammonia has its limitations. The present atomic clock is accurate to about one second in eight months. By using other atoms or molecules, still higher precision—as great as one second in 300 years—is expected.

This exact control of wave frequencies may also permit squeezing more TV channels into the crowded radio spectrum, since each could fit into a narrower band. **END**



First of two multimillion-volt Van de Graaff generators for Brookhaven National Laboratory is assembled at General Electric plant, Sche-

nectady. Dotted lines represent motor-driven belts that will convey electrical charges to build up man-made lightning of 3,500,000 volts.

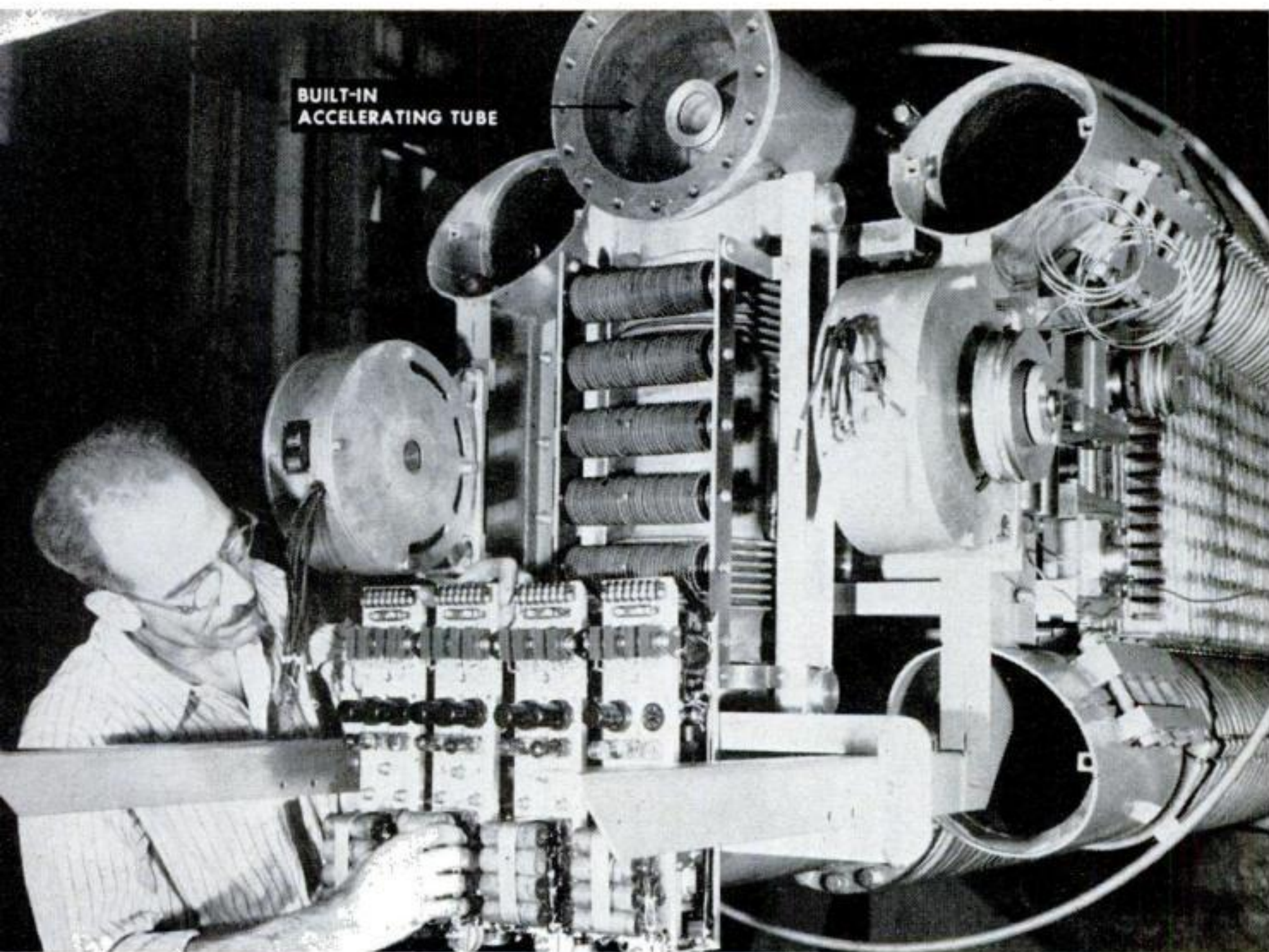
‘Assembly Lines’ Built For Lightning Factory

PILING up electrical charges by means of whirling conveyer belts, a pair of multimillion-volt Van de Graaff generators will assemble artificial thunderbolts in a modern lightning factory at Brookhaven National Laboratory, Upton, N. Y.

The larger generator, a 4,000,000-volt machine still in the design stage, will have the more spectacular role. A potent atom-smasher in its own right, it will feed one of the mightiest on earth—Brookhaven’s projected 3,000,000,000-electron-volt “cosmotron.” (This new name has been chosen for the monster, doughnut-shaped proton synchrotron, 60 ft. in diameter, described in *POPULAR SCIENCE* last year: Jan. ’48, p. 113;

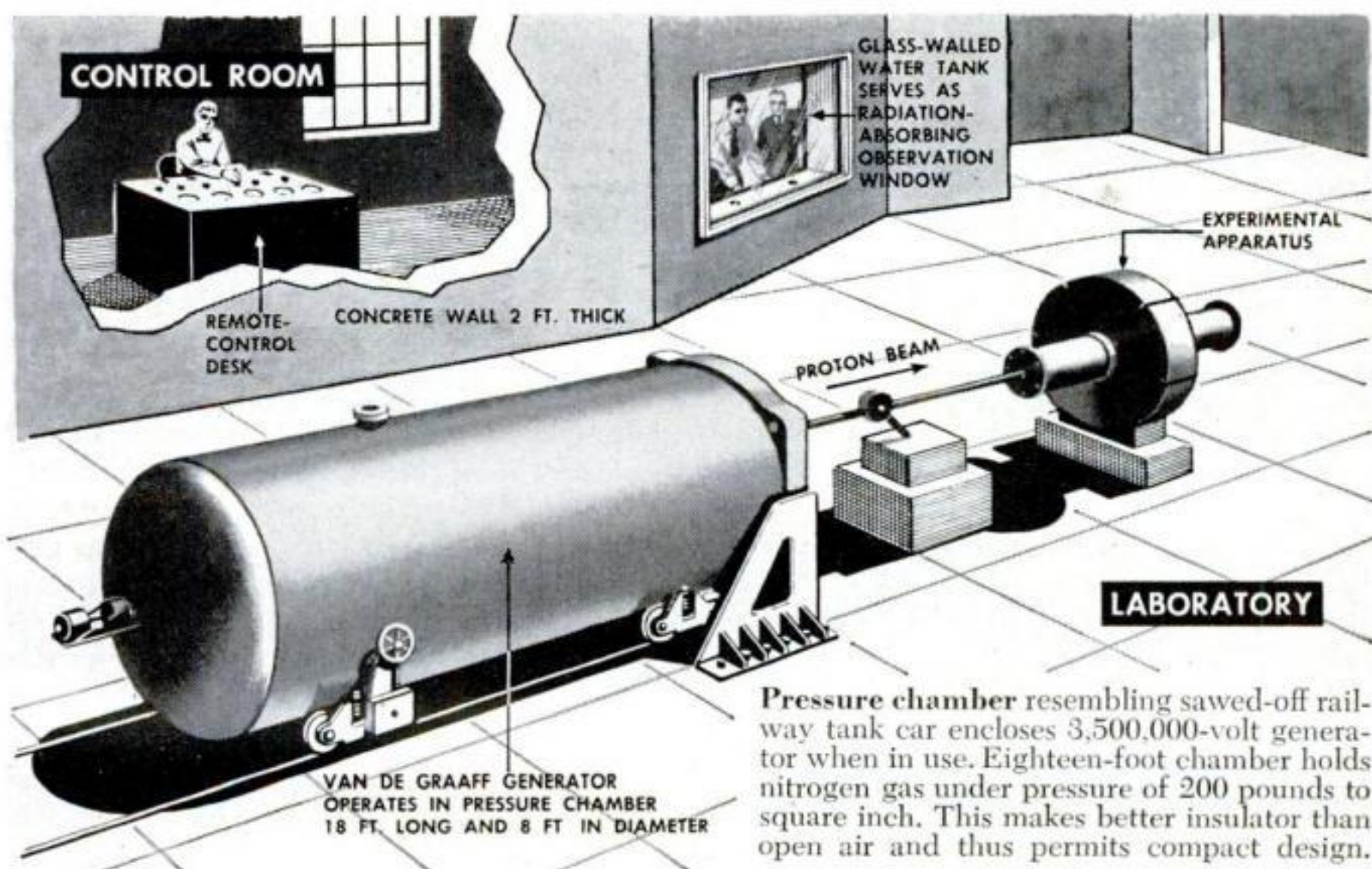
July, ’48, p. 270.) The Van de Graaff generator will deliver a beam of protons to the giant atom-smasher for further acceleration.

Meanwhile, Brookhaven will place in service a 3,500,000-volt Van de Graaff generator in an atom-smashing laboratory of its own. Experimenters will operate it by remote control, shielded from dangerous radiation by two-foot-thick concrete walls, to produce neutron beams, study transmutation of elements, and develop such techniques as gamma-ray spectroscopy. This generator will also be used by the research workers to perfect the design of the larger one and the method of injecting its beam into the cosmotron.



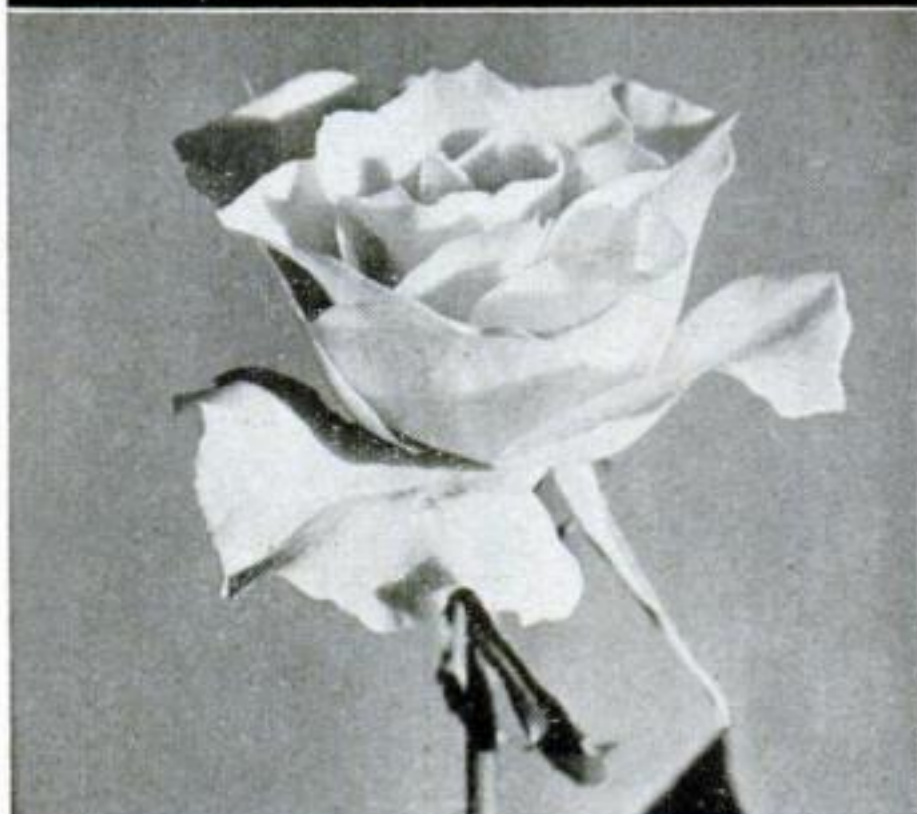
Built-in accelerating tube will harness power of 3,500,000-volt generator to produce a beam of speeding protons, or positively charged hy-

drogen particles, for experimenters to wield. Panel below tube transmits performance data to dials of remote-control desk used by operator.



Pressure chamber resembling sawed-off railway tank car encloses 3,500,000-volt generator when in use. Eighteen-foot chamber holds nitrogen gas under pressure of 200 pounds to square inch. This makes better insulator than open air and thus permits compact design.

EVERY KNOWN SMELL IS COMPOSED



FRAGRANT odor, most pleasing of fundamental ones, predominates in scent of rose, above, other flowers and perfumes made from them, cedar wood, spices like cinnamon and nutmeg.



ACID smell, the second in human preference, stands out especially in odors of vinegar and acetic acid. Fruity odor of lemons, oranges, and grapefruit is largely fragrant-plus-acid.

What Is a Stink?

Science has found an ingenious way to define odors
and offers a new explanation of how you smell them.

By Alden P. Armagnac

YOU can tell a rose from a skunk with your eyes shut. But just *how* does the "stink" of a pig-in-the-pen differ from ham-in-the-pan that "smells good"? Why do things smell the way they do, anyway?

Salesmen as well as scientists would like to know the answers. The appetizing odor of your breakfast bacon, the fragrant aroma of a cigarette, are Big Business. Pleasing odors, artificially imparted, help to sell soaps and cosmetics, wallets and handbags of artificial leather, raincoats, linoleum, fabric for suits and dresses, paint, paper, and printer's ink.

Yet the art of creating and using odors has so far to go to become an exact science that even its vocabulary reflects its groping.

How would you describe a smell? You could take almost any adjective in the English language—"pungent," "aromatic," "flowery," or "spicy," to mention a few—

and apply it equally well to any one of hundreds of different odors.

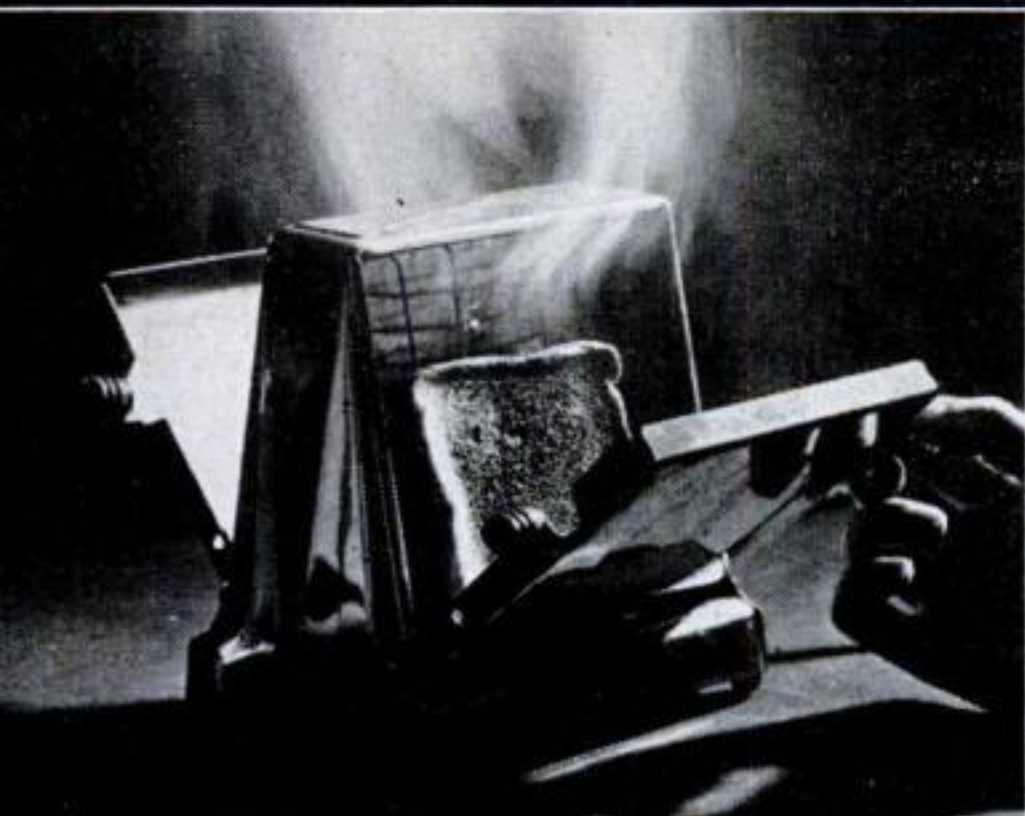
Colors of the spectrum can be readily identified by their wave length, the pitch of a musical tone by its frequency—but meat packers and perfumers have been able to describe individual odors only as "like roses," or like camphor, or new-cut hay, as the case might be.

Only recently has an ingenious way been perfected to name and define any one of the 4,000 to 8,000 different odors that your nose can distinguish.

Called the Crocker-Henderson system after its originators, E. C. Crocker and L. F. Henderson, it applies their discovery that all smells can be regarded as blends of just four "primary" or fundamental odors.

These four basic smells are called "fragrant," "acid," "burnt," and "caprylic," the last meaning goatlike. The fragrant component predominates in heliotrope and jasmine; the acid, in vinegar and in its

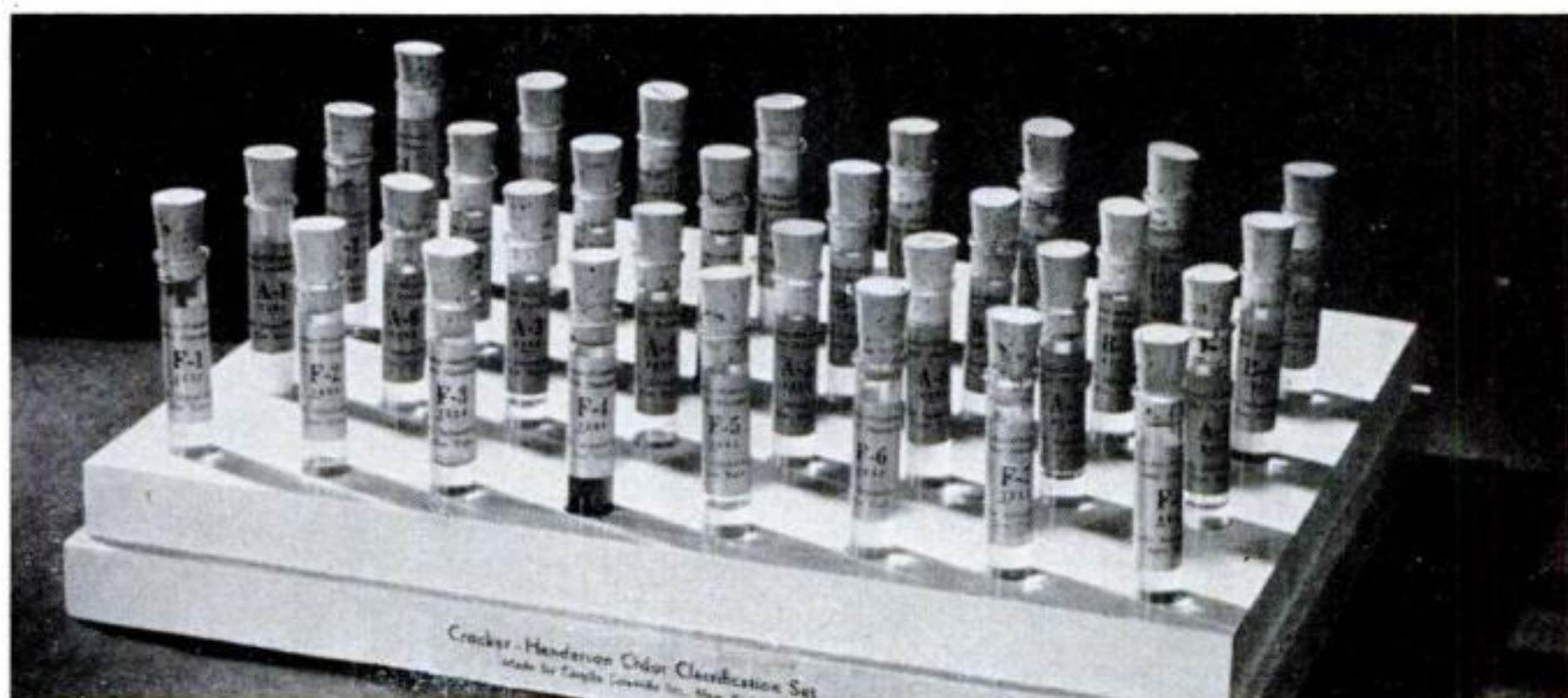
OF THESE FOUR BASIC ELEMENTS



BURNT odor, third fundamental one, may not appeal to you when you scorch the toast, but is an important ingredient of oriental perfumes. It's also prominent in moth balls and tar.



CAPRYLIC means goatlike, but this basic scent characterizes all animal odors—exemplified above by Stinky the Skunk. Name any foul smell and you'll find its caprylic ingredient strong.



Defining a stink or a perfume exactly is made easy by this "odor-classification set" recently placed on the market. Each row of numbered vials contains samples of substances arranged,

from left to right, in order of increasing intensity of one of their four fundamental odors. By matching a scent against them, user obtains a four-digit number that precisely describes it.

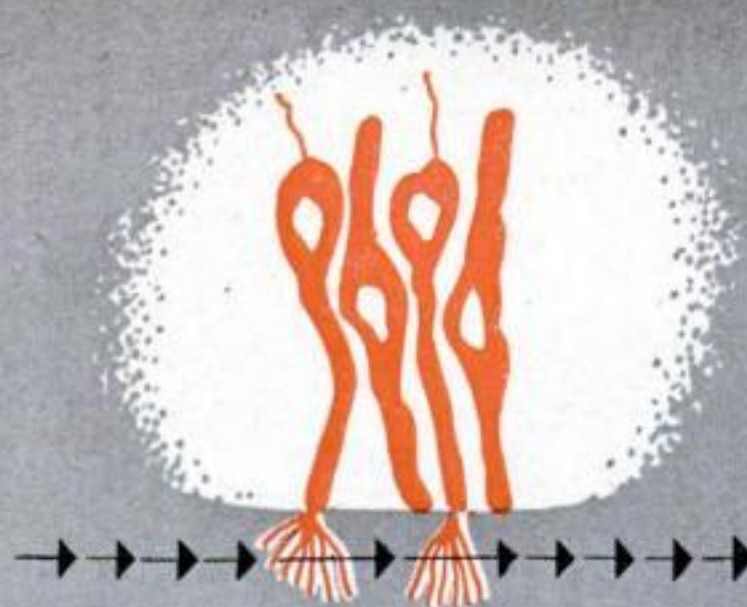


Typical numbers obtained when odors are matched with vials of testing set are illustrated above for moth balls (naphthalene), spruce tree, lemon, and fresh-cut hay or the substance called

coumarin, its equivalent in perfumery. Any one of the 4,000 to 8,000 odors that your nose can distinguish may be identified, beyond all uncertainty, by a number between 0000 and 8888.

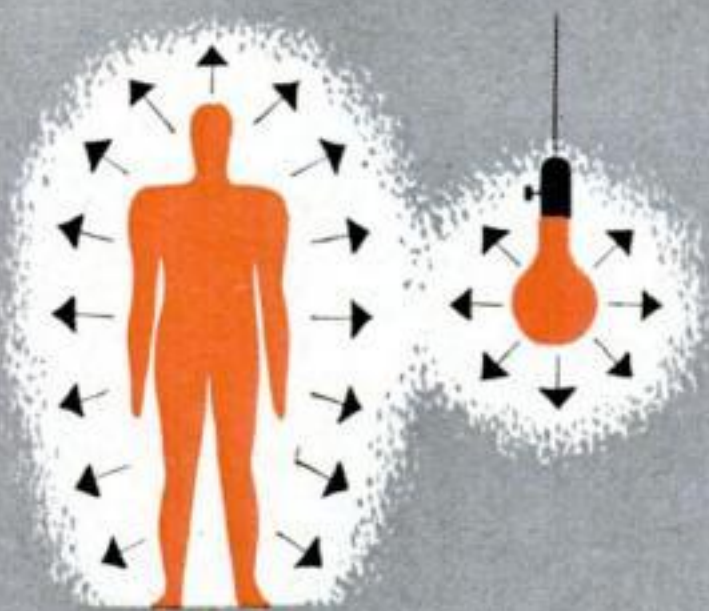


Seat of your sense of smell, the olfactory cleft (shown in color) lies at roof of nasal cavity. It detects odors in air passing inward from nostrils, or upward and outward from mouth.



Smell-detecting cells of olfactory cleft, shown highly magnified, have tufts of microscopic hairs projecting into air passage. Mystery of how they work may be solved by new theory below.

HOW NEW "RADAR" THEORY EXPLAINS SENSE OF SMELL



1. A man of average size constantly emits about the same amount of heat as a 100-watt electric lamp bulb—much of it in the form of radiant heat or invisible infrared radiation.



3. Loss of similar infrared rays from olfactory region of nose, new theory holds, gives sensation of odor instead of chill. Odor-bearing substances are known to absorb infrared.



2. Place your hand above an ice-cube tray and you can feel its coldness without touching it, due to loss of infrared radiation from your warm hand that is absorbed by the colder tray.



4. So olfactory cells act like miniature radar stations, and you smell a substance when airborne particles come within range of their rays, which are absorbed instead of being bounced back like radar waves. Cells emit various wave lengths, different substances absorb different ones — and smell different.

natural constituent, acetic acid; the burnt, in tarry and scorched substances; and the caprylic, in cheese and rancid fat.

Like all the colors that result from mixing three primary hues, every odor from that of the rose to the skunk's appears to consist of a blend of these four primary odors.

Suppose you invent an arbitrary scale, ranging from zero to eight, for measuring the intensity or strength of each of these ingredients in a complex smell. Now imagine that a certain odor proves to have a fragrant intensity of six, an acid intensity of four, a burnt intensity of two, and a caprylic intensity of three. What have you got? Nothing other than the smell of a rose! At last this elusive fragrance can be pinned down and defined, beyond all uncertainty, simply by the number 6423.

This is the Crocker-Henderson method of naming smells. Similarly, by simple four-digit numbers between 0000 and 8888, it will define any known odor. For example, the scent of camphor is 5735, and the smell of ethyl alcohol is 5414.

Finding the odor number of a perfume or of any other commercial product is made easy by an "odor-classification set" now on

the market. Alternately the user sniffs a sample of the product and standard samples representing graduated intensities of each fundamental odor, until he finds the four "standards" that match. These standards are rows of vials containing especially selected liquids, such as ethyl alcohol to represent the No. 1 intensity of the burnt component. "Pure" fundamental odors, which do not seem to exist in nature, are neither available nor necessary for standards. Even an untrained person finds no difficulty in concentrating on one component of a complex odor at a time, while completely ignoring the others.

Given the number of an odor, conversely, you can tell what it will be like. A smell with a number ending in "8"—for the caprylic ingredient—will be fetid, rancid, garlicky, tarry, "metallic," or fishy. That's about the nearest that science has come to defining a stink.

The rest of the secret of what is an odor belongs to the realm of physiology and lies hidden in the two little dime-sized areas, at the roof of the nasal cavity, that make up the olfactory cleft. This is the seat of your sense of smell, the most mysterious of all human faculties. Microscopic



Airtight containers of honey, shown with and without "bird-house" camouflage, attract bees when fitted with plastic panes transmitting infrared rays. Test supports new theory of sense of smell offered by Prof. W. R. Miles (reading thermometer above) and Dr. L. H. Beck of Yale.



Glass walls of "smell-proof" room exclude unwanted scents while subject garbed in odor-free coveralls of fiber glass, at right above, sniffs aroma of sample in bottle. In this way, Cornell University experimenters are measuring how faint a smell the human nose can detect.



"Perfumer's organ" in Du Pont laboratory at New Brunswick, N. J., holds 300 different concentrated scents on racks. Girl cosmetician tests formulas of synthetic fragrances that will enhance sales appeal of household soap, cosmetics, and many other commercial products.

cells lining air passages and bearing tufts of tiny hairs somehow detect odors and tell them apart. How they do it and just what stimulates them have puzzled scientists since the study of physiology began.

Do airborne particles, settling upon the olfactory cells, produce chemical reactions that give rise to sensations of odors? We know for a fact that taste buds detect flavors by chemical reactions—but it strains the imagination to account for our sense of smell, 10,000 times as sensitive as our sense of taste, by the same mechanism.

Experiments conducted within the last two years at Yale University by Dr. Lloyd H. Beck and Prof. Walter R. Miles now indicate that the long-standing mystery may have been solved. Insects, which lead the rest of the animal kingdom in keenness of smell, were their subjects in the tests.

In one of their most striking experiments, the researchers placed fragrant honey in airtight containers, picturesquely camouflaged as bird houses, from which no smell could possibly escape. Then they liberated bees nearby. The bees swarmed around some of the boxes, pointedly ignored others.

Boxes that attracted the bees all had windows of plastic panes, which would transmit invisible infrared rays of a wave length of exactly 8 to 14 microns, or thousandths of a millimeter. The other boxes had exactly similar plastic windows, but these were also covered with glass panes that did not transmit infrared rays.

From this and other trials, which now are being extended to human subjects, the experimenters offer the following amazing explanation of the sense of smell:

Human organs of smell, like those of the insects used in the tests, resemble miniature radar stations. In common with the rest of the body, they constantly emit radiant heat or infrared rays. When these rays strike substances that have odors, they are absorbed, instead of being bounced back like radar waves. Just as loss of radiant heat chills your hand when you hold it over an ice-cube tray, olfactory cells can detect the absorption of the rays they emit when airborne particles enter the nose and come within range. In their case, instead of a feeling of chilliness, a sensation of odor results.

Wave Length Determines Odor

As has already been known, substances with different odors absorb different wave lengths of infrared. Presumably, individual olfactory cells emit correspondingly different wave lengths. At any rate, what odor you smell depends upon the particular wave length absorbed. For a substance to have an odor at all, this wave length must lie between 8 and 14 microns. Your sense of smell doesn't respond to wave lengths beyond that range, any more than your eye can see light of wave lengths beyond the range of the visible spectrum.

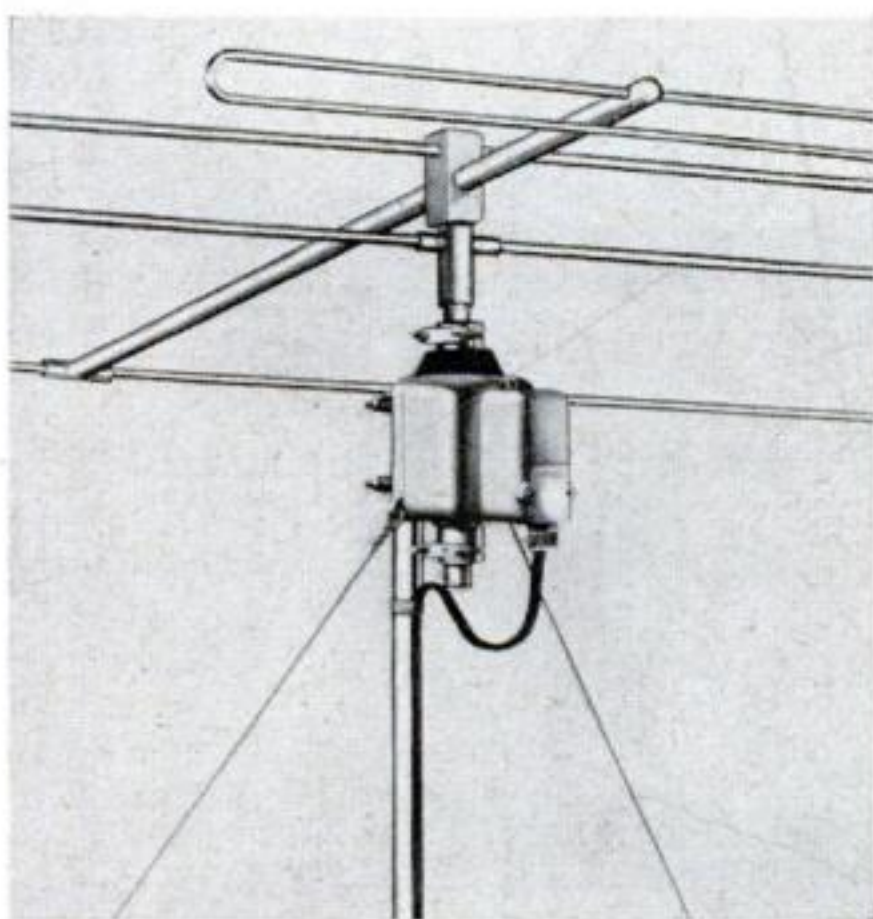
Unlike the "chemical" theory, which the experiments seem to disprove, this ingenious new one appears to fit all the known facts. By eliminating the need for airborne particles to come in actual contact with the smell-detecting cells, it explains how your nose can detect fantastically small amounts of a substance. It helps, too, to understand the incredibly keen scent of insects—whose external organs of smell, in their antennae, may be "long-distance radar stations." And, if confirmed, the Beck-Miles explanation may have far-reaching practical applications in the industries to which an understanding of the sense of smell is so important. **END**



TV Sets Give Bigger Pictures

THERE'S no waste of tube space in these new Zenith (left) and Garod (right) television sets. By spreading the standard rectangular image over the full face of the tube, they provide a circular picture 50 percent larger with only a small amount cut

off at the corners. Thus a blown-up image on a 10-inch tube is actually larger than a standard image on a 12-inch tube. The Garod set features a remote-control switch on a 15-foot cord by which the viewer can select the blown-up or standard image. The Zenith provides for possible future TV reception over telephone lines.



Rooftop Motor Turns Antenna

You can rotate your TV or FM antenna to the exact point where reception is best with this Tenna Rotor®. It is mounted on the roof and has a 110-volt electric motor that rotates a hollow shaft into which the antenna mast is clamped. It turns the antenna 360° in either direction and is controlled from inside the house by a switch.



Mirror Becomes TV Screen

WHAT looks like an ordinary wall mirror becomes a television screen in this Sight-mirror®. The TV receiver, with its 15-inch tube, is recessed into the wall and covered with a special mirror that lets the picture show through when the set is on. It can be operated from up to 30 feet away with a remote-control box (left foreground).

'49 Dodge: More Room in Less Space

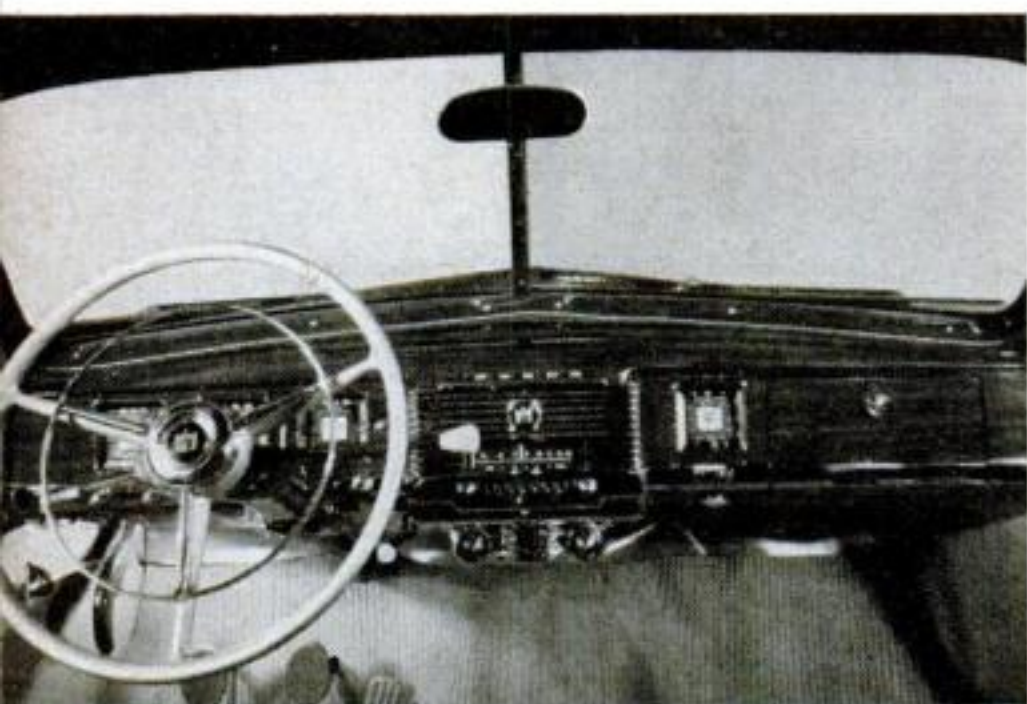
THE 1949 Dodge, announced late in February, reverses the automobile trend toward bulkiness. But though height, width, and length have been reduced, the new models actually have more room inside than last year's. This has been accomplished by swelling out the side body panels.

The Dodge division of the Chrysler Corp. has also made a move to meet complaints about the high price of cars. Emerging ahead of Plymouth as the sales leader of the Chrysler line, Dodge will offer a priced-down model called the Wayfarer® with a 115-inch

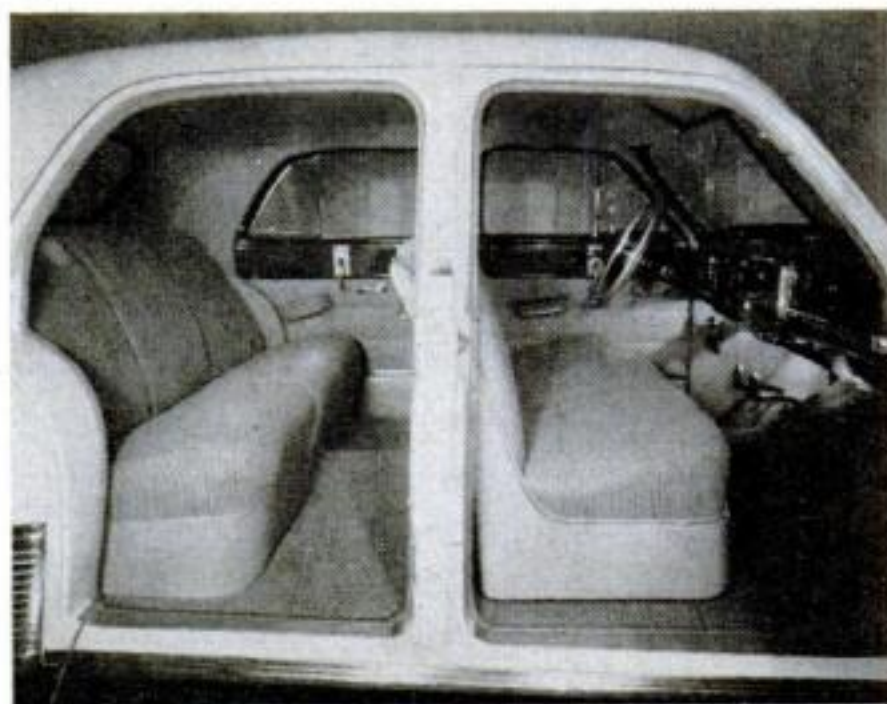
wheelbase. This is 8½ inches shorter than that of the higher-priced Coronet® and Meadowbrook® models.

Engine compression ratio in the new Dodges has been boosted to 7-to-1. Windshield area is increased by 24 percent. Larger rear windows cut down blind spots. By Cycle Bonding® brake linings, Chrysler Corp. this year eliminates the riveting that in the past has scored the drums.

Important to the motorist conscious of repair bills are fender units that can be removed simply by unbolting them.



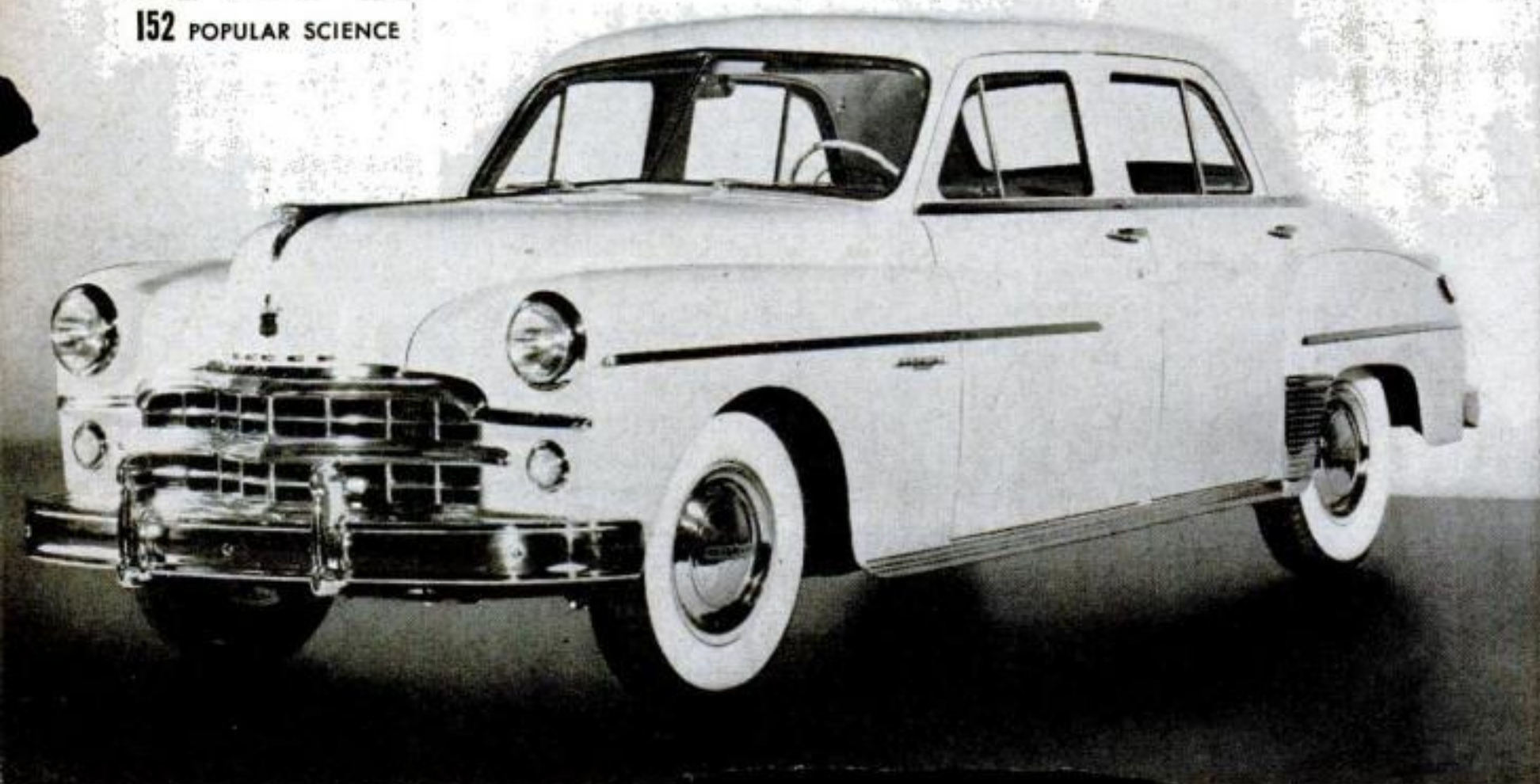
Instruments of new Dodge are recessed to avoid light reflections. Car is slightly shorter, 3 in. narrower, 2 in. lower. Wheelbase is 4 in. longer. Headlights are higher off road.

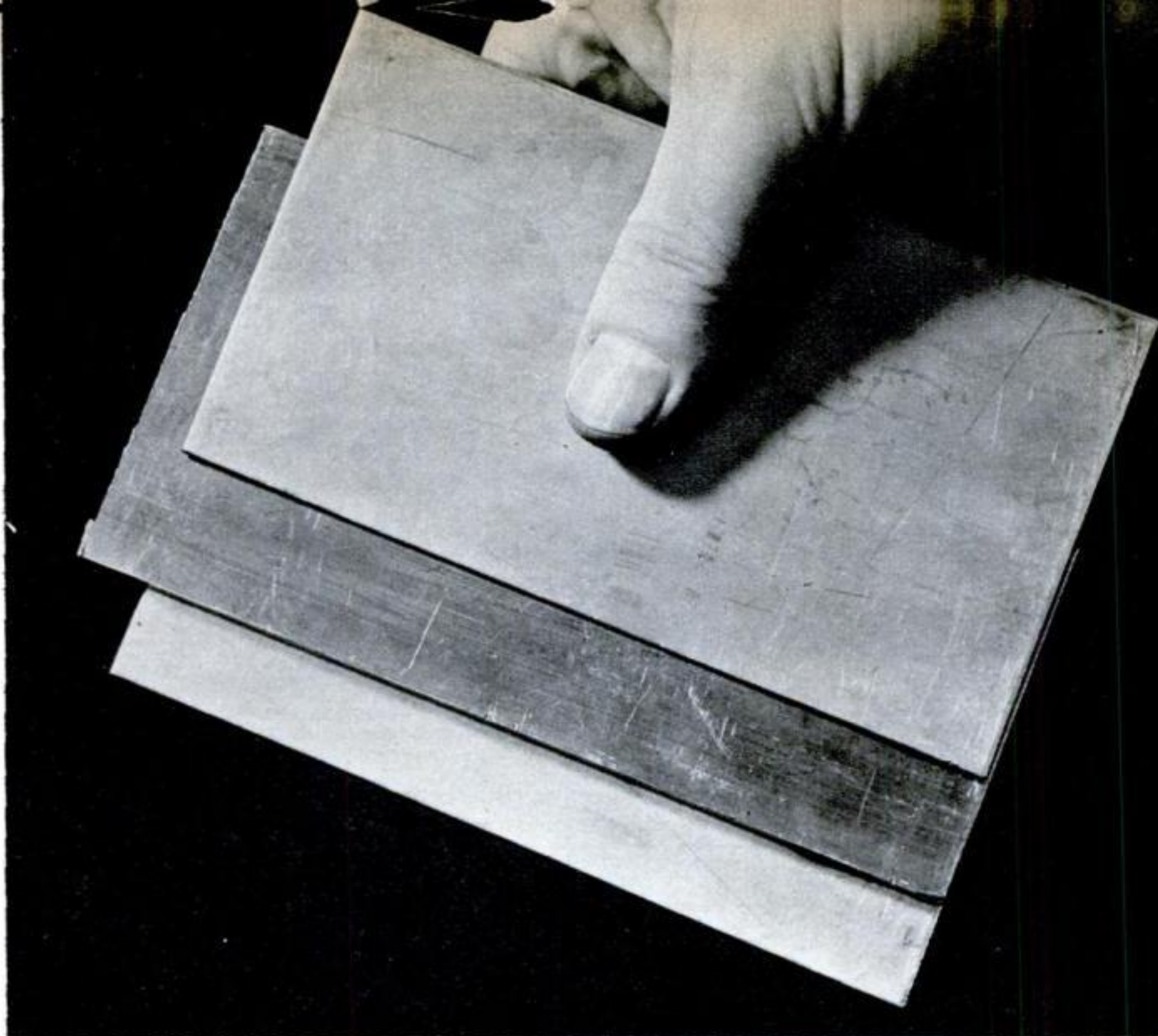


Front seats are 6 in., rear seats nearly 8 in., wider. Headroom is 37 in. Instrument panel is moved ahead 4 in. to lengthen passenger compartment. Rear doors are hinged at center post.

Four-door Coronet® model (below) typifies body lines of new Dodge, produced in 11 styles.

152 POPULAR SCIENCE





Raw materials for a clad metal: one sheet of copper between two sheets of stainless steel.

Married Metals Improve Both Pots and Planes

Cladding copper and steel, steel and stainless, silver and bronze creates new materials combining old advantages.

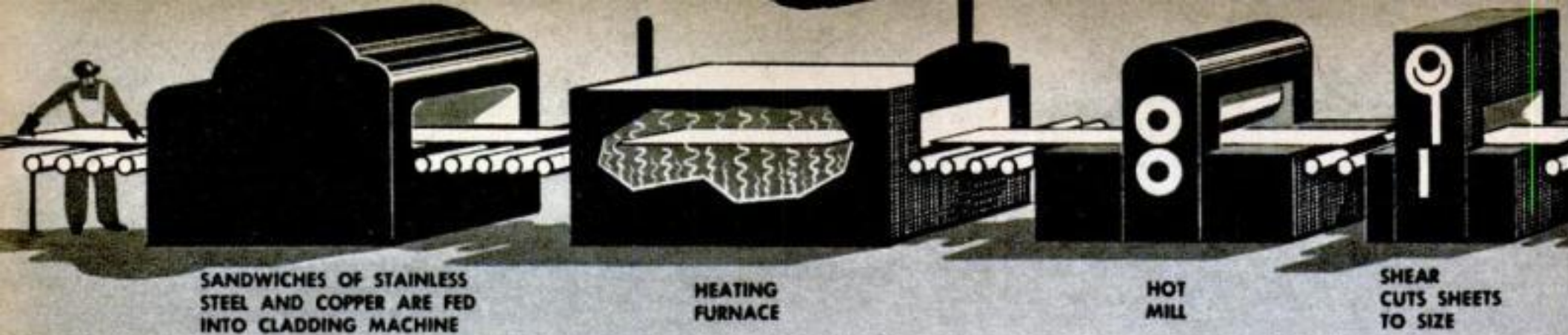
By George H. Waltz, Jr.

PS photos by Hubert Luckett

SHEET metal with a dual personality now is being formed into shiny, quick-heating pots and pans for your kitchen. Pressed from thin metal sandwiches consisting of a sheet

of copper between two sheets of stainless steel, the new utensils combine the easy-to-clean quality of stainless steel with the high heat conductivity of copper.

Because stainless steel is strong as well as easy to keep clean, it long has been used for pots and pans. Unfortunately, however, while it is one of the best noncorrosive metals, it also is one of the poorest conductors of heat. Compared to copper, the "master conductor," its ability to conduct heat is only 6.1 percent. Stainless-clad copper, of the type being used

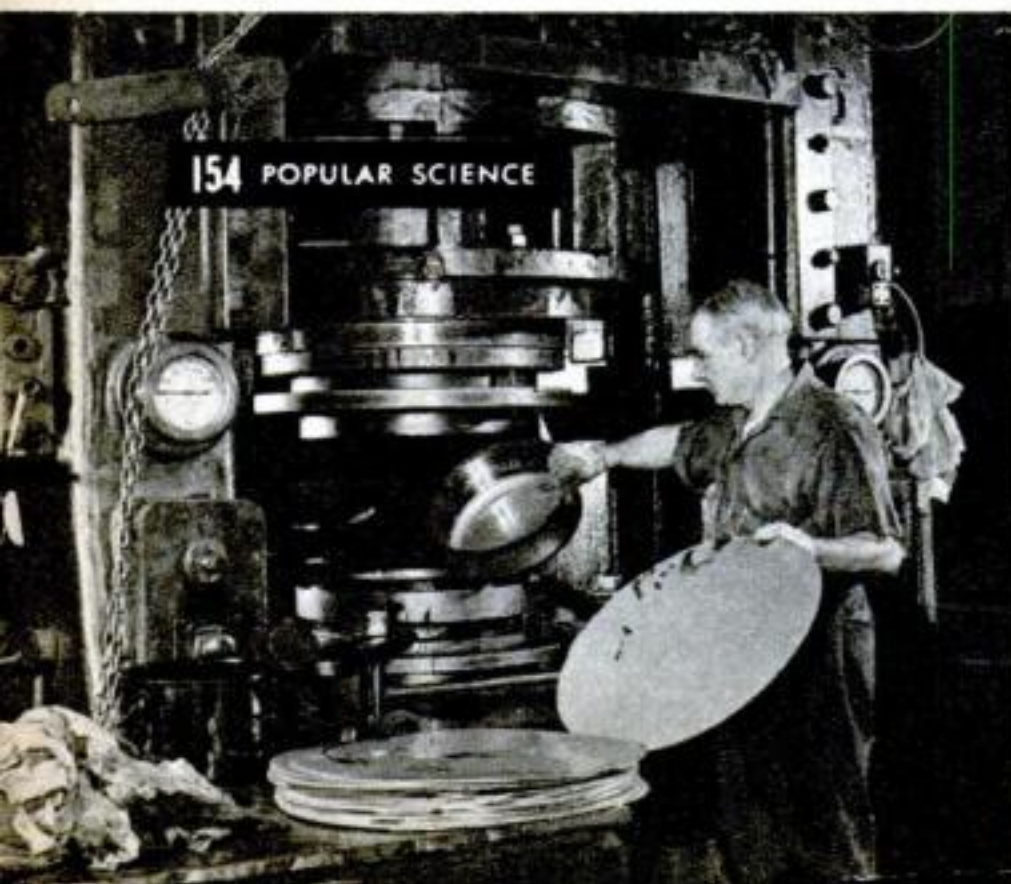


Flow chart above and on the next three pages shows how copper is clad with stainless steel.



Hotel cooking pots of copper between stainless steel are shown at various stages of their production by Lalance & Grosjean Mfg. Co. at Woodhaven, L. I. Photos below show how they're made.

Hydraulic press shapes deep pots from disks of clad metal. Drawing out the metal is done in three steps. In photo below, operator shows how pot looks before and after the first draw.

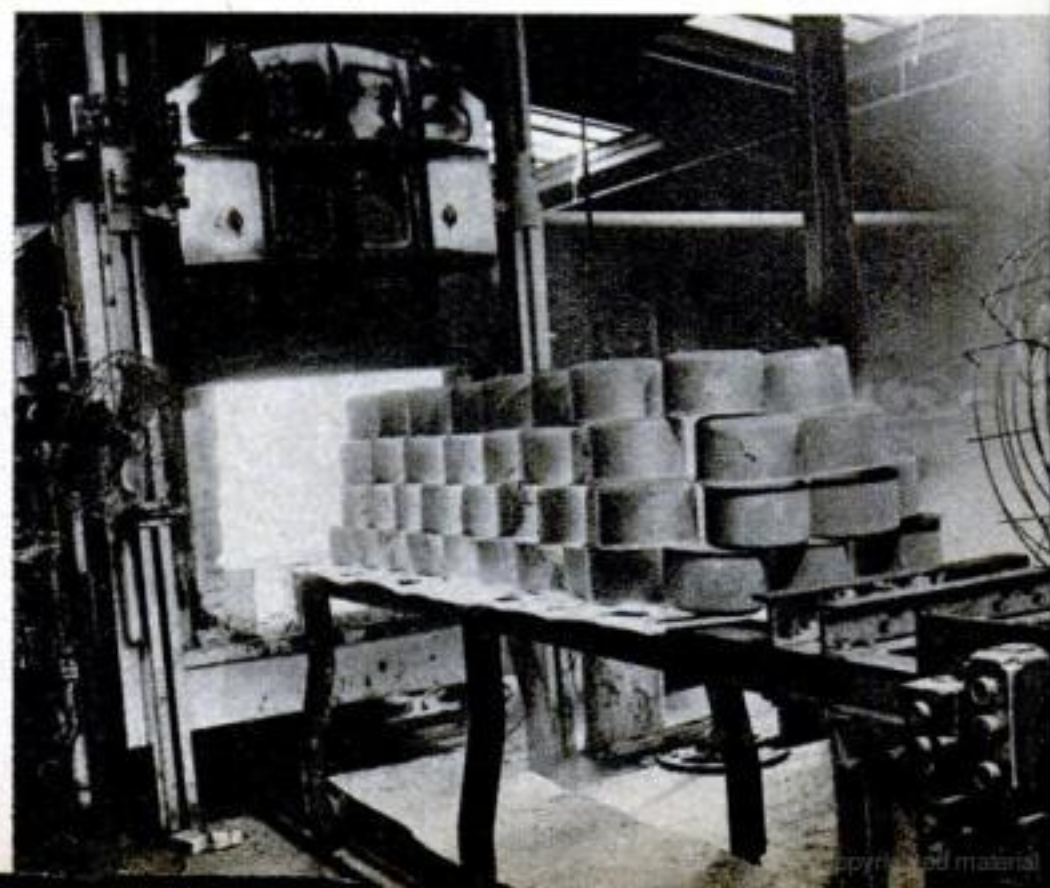


for the new utensils, on the other hand, scores better than 54 percent—more than half as good as highly corrosive copper alone and nine times better than the noncorrosive stainless steel alone. Fashioning kitchen pots and pans from the new stainless-copper-stainless sandwiches utilizes the best properties of each metal: the utensils not only heat well, but they are strong and easy to keep spotless.

The main importance of these new steel-copper-steel pots and pans, however, goes far beyond their convenience to the housewife and the restaurant chef. They mark a milestone, for they are another *first* in the fast-growing clad-metals industry.

Basically, a clad metal is one made of two dissimilar metals that have been permanently bonded into a rolled sheet or product. The process is not electroplating, and it uses no cement or binder. The dissimilar metals are simply pressed together between the wringer-like rolls of a cladding machine. By applying just the right pressure at just the right temperature for just the right length of time, the process bonds the metals together molecularly, and no amount of tension can pull them apart. A cross section of a clad metal viewed under a microscope shows that some of each metal has diffused into the other to form a

Pots are annealed in this large gas-fired oven (below) before each trip to the press. The pots shown have been through the initial drawing and, when they cool, will be drawn again.





Bonding requires just the right pressure at the right time, and for the right length of time.

tenacious bond that is an alloy of the two.

Clad metals are not new. The idea is perhaps some 6,000 years old, but it took the needs of World War II to bring it into wide use. The first clad metal on record was used by the early Egyptians, who hammered soft silver into copper to form a workable material for their ornate jewelry. The first Sheffield plate, made by 18th century craftsmen in Sheffield, England, was basically a clad metal, too. Soft pure silver was hammered onto copper to make this hand-wrought tableware durable as well as beautiful. Later, in Pforzheim, Germany, jewelry makers clad copper with gold to obtain rigidity in delicate ornaments.

Steel Bullets Clad with Copper

Although a few European arsenals during World War I made bullet jackets by cladding copper alloys onto steel, it was not until World War II that all nations not only fired copper-clad steel bullets but used clad metals in many other ways. Shortages of some metals made cladding necessary to piece out the supply; in other cases, the unique results of combining metallic qualities made cladding desirable.

Since the war, the peacetime uses of the

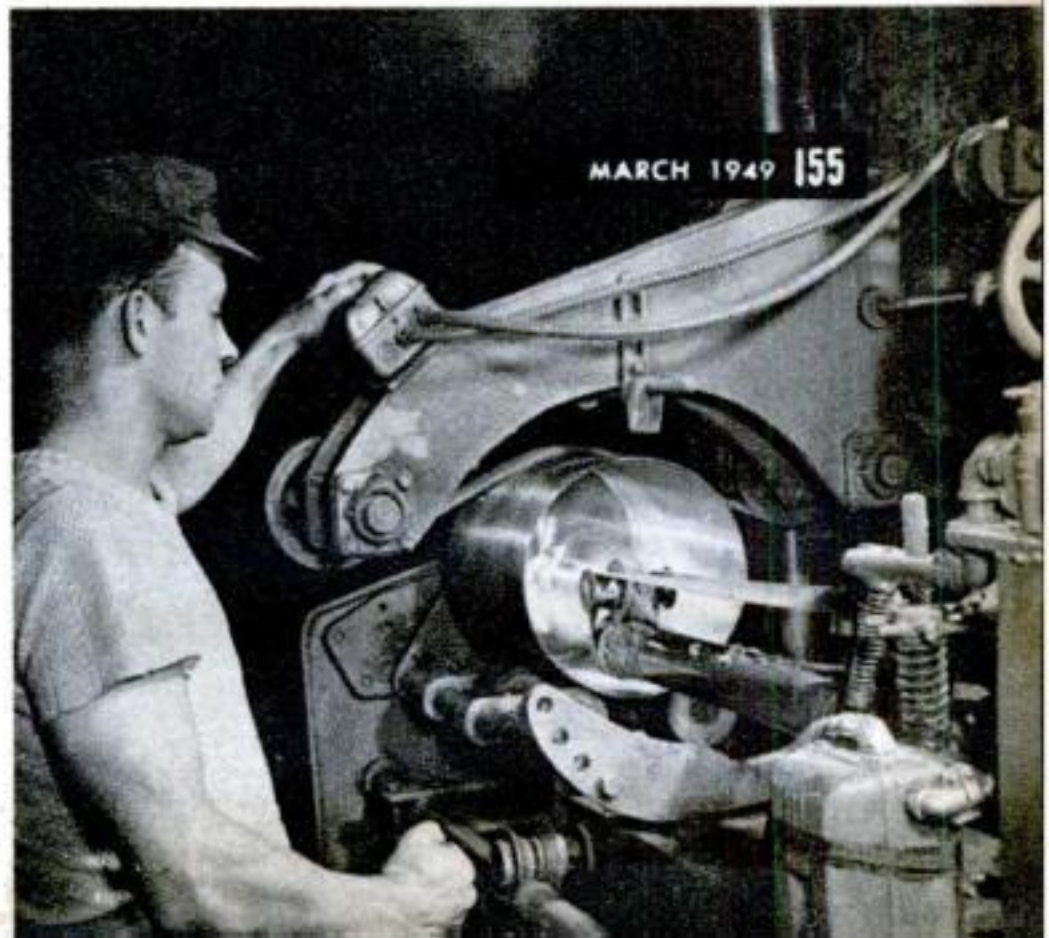
clad metals—stainless steel and copper, carbon steel and copper, stainless steel and carbon steel, carbon steel and nickel, silver and mild steel or bronze—have increased by leaps and bounds. At last count, in the United States alone there were a dozen large producers of clad metals.

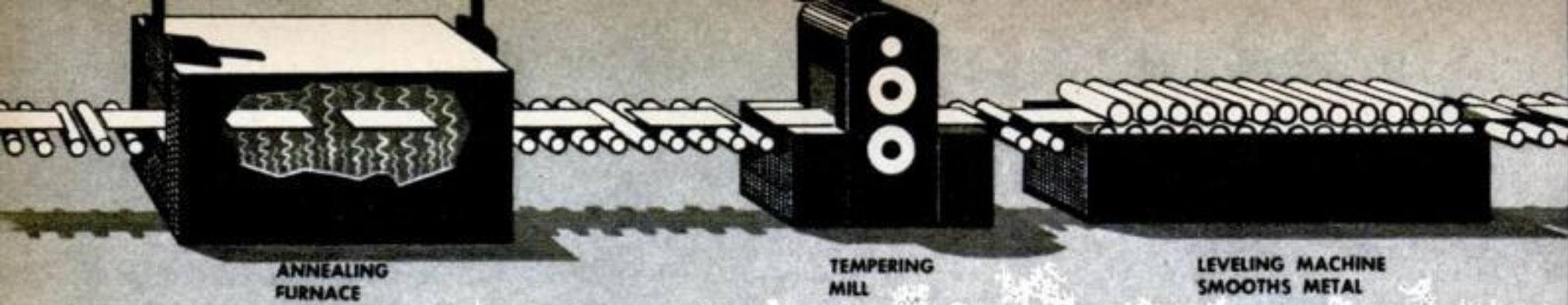
In industries ranging from aviation to zymurgy (brewing), design engineers are finding more applications for clad metals. They lend themselves particularly well to industrial processes in which large vats, used for storage, heating, or mixing, must both conduct heat well and be easy to clean. Fragile glass-lined tanks for storing and transporting milk are being replaced by tanks of sturdier steel clad with stainless steel. The steel gives strength, while the stainless steel provides a noncorrosive, easily cleaned surface. Tile-lined vats used in the paper and pulp industry are making way for vats of the stainless-clad steel.

One cereal manufacturer had for years been using tanks lined with carbon steel for mixing the salt and vinegar that went into his recipe. Because corrosion caused the steel to flake off, he had to employ a series of electromagnets to remove the metal chips from his finished product. Processing equip-

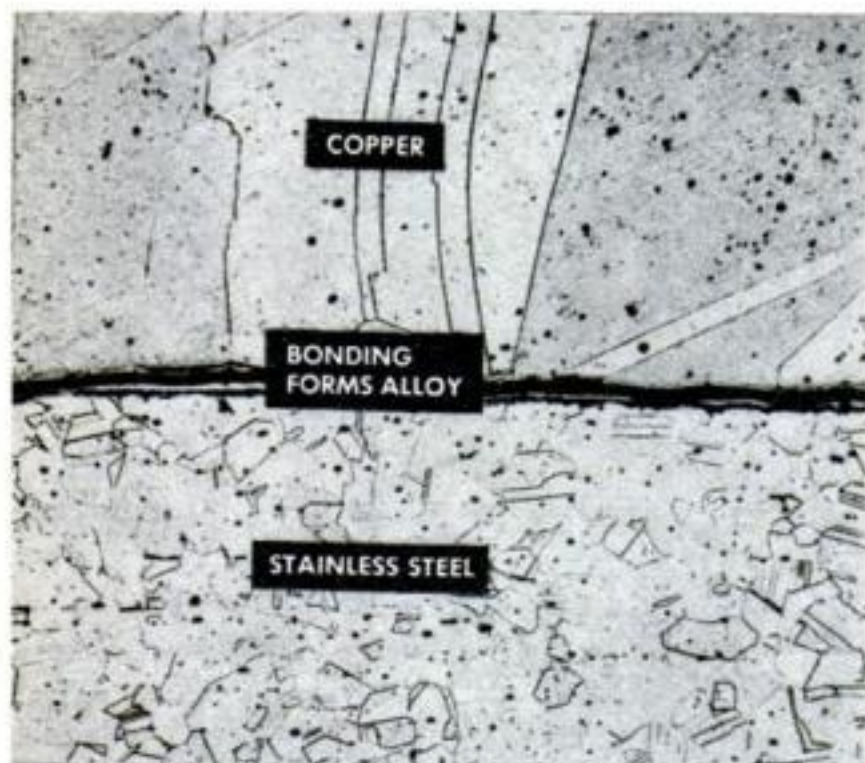
After three drawings, the pots are cleaned and placed in the trimming machine below. As the pot is revolved, a circular knife evenly slices off the ragged rim of excess metal at the top.

Polishing machine automatically burnishes the pot after it has been cleaned and trimmed. In photo below, the inside is being finished. An emery belt provides the polish as the pot spins.





Cladding process shown here and on previous two pages is used by American Cladmetals Co.



In microscopic view of clad metal, showing a partial cross section magnified 200 times, you can see how the two dissimilar metals are bonded by fusing into an alloy where they meet. Their molecules actually mingle to form a permanent bond that is as strong as the metals themselves.

Simple experiment (below) shows clad metal's superiority to plain stainless steel as heat conductor. Water in both tumblers was 70° F. at start. Now temperature of water heated through

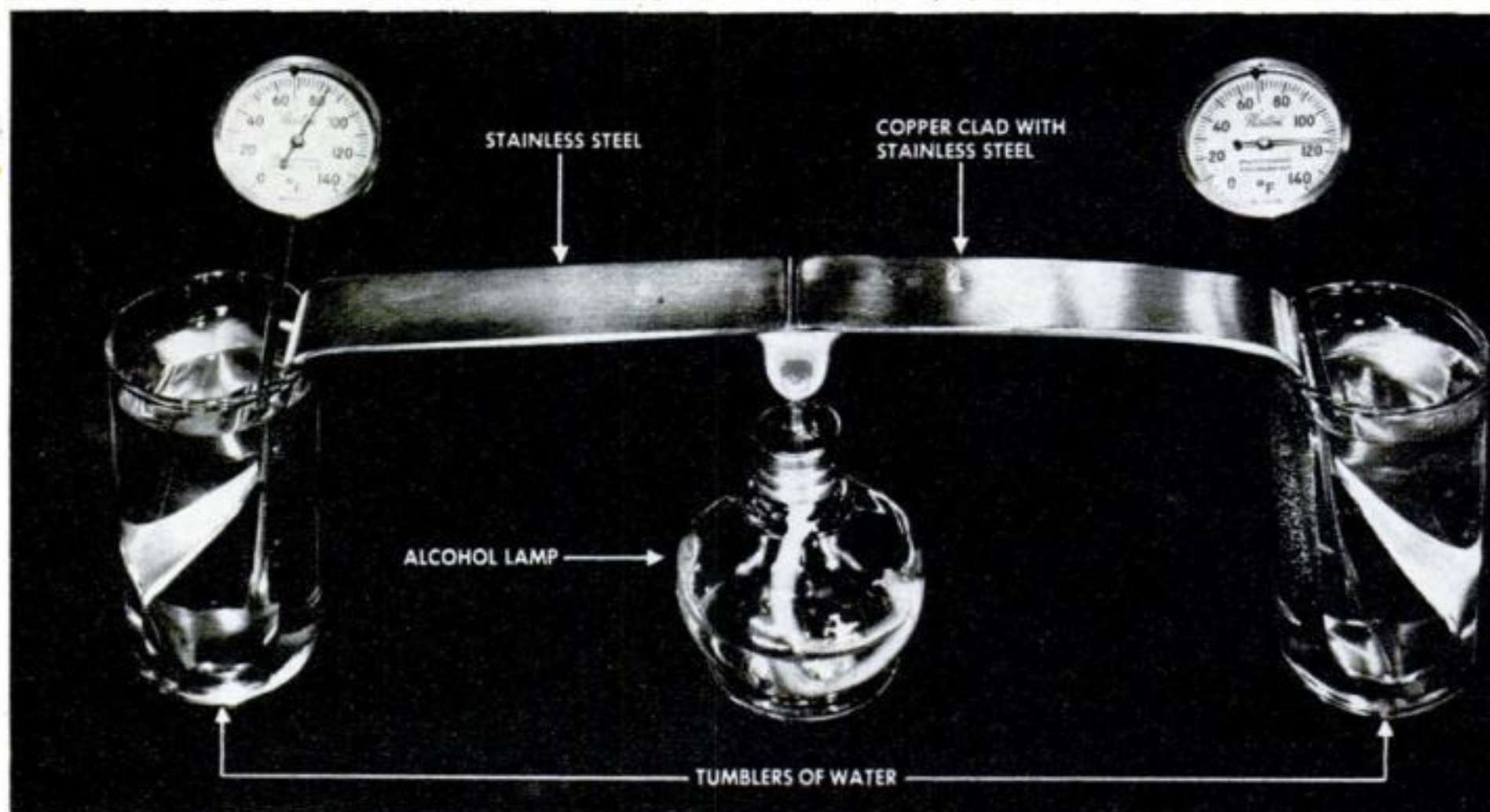
ment made of stainless-clad steel has now solved his problem for him.

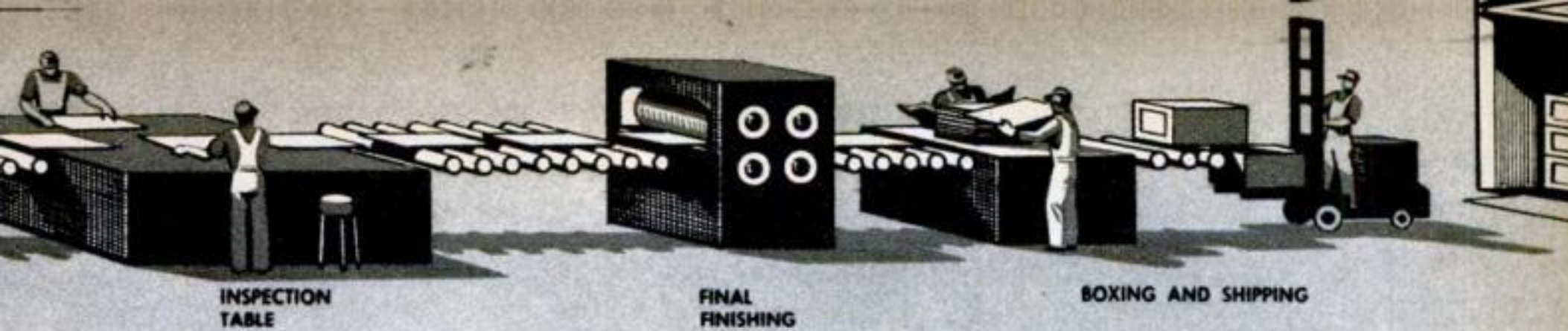
The automotive companies are experimenting with clad metals along many lines. Engine manufacturers are exploring the possibility of using silver-clad carbon steel for low-friction, high-speed bearings. The accessory people see in stainless-clad steel an excellent material for automobile bumpers, headlight and fog-light shells, and hub caps.

With higher and higher operating pressures in automobile engines (PS, Jan. '49, p. 166), the failure of engine gaskets is becoming more and more of a problem. Gaskets made from a sandwich of copper over carbon steel show good promise of providing the answer. The central filling of steel gives the necessary strength, and the copper, as in the conventional gasket, provides a soft material to form a firm seat.

Similarly, clad metals are finding many

clad metal has risen more than three times that of water heated through stainless steel. Under controlled laboratory conditions, the difference in conductivity proves more than nine times.





Three metal sheets emerge as molecularly bonded sandwich from Carnegie, Pa., cladding plant.

uses in the electrical industry. The process of cladding makes it possible to put a thin layer of silver, gold, or platinum on strips of bronze or other metal to be used as electrical contacts. Although only a small amount of the expensive metal is used, it provides a non-pitting, noncorrosive surface particularly valuable in ignition and similar circuits.

In long lines for transmitting electric power, copper is still the most efficient conductor. But copper forms a relatively weak wire that literally pulls itself apart under its own weight when stretched unsupported for long distances. By cladding a steel wire with copper, power companies now couple the high conductivity of copper with the great strength of steel. Copper-clad steel wire accounts for practically the entire output of one large clad-metal producer.

The copper-clad steel wire is drawn from an ingot of steel that has been carefully

centered in a graphite mold and surrounded with molten copper. A molten weld takes place and the resulting billet consists of a steel center covered on all four sides with an outer coating of copper. The billet is then rolled and drawn.

Clad Metals vs. Shortages

Clad metals have won more friends in industry by providing substitutes for scarce metals. Not long ago, when a shortage of tin made it difficult for a large manufacturer of gas meters to maintain peak production, the company shifted to a clad-metal sandwich of carbon steel between sheet copper. Although this started as a stop-gap operation to combat the lack of sheet tin, the copper-steel-copper meters proved so superior that the manufacturer has continued making them in spite of their higher cost.

But the big reason for the growing popularity of clad metals is their dual personality, combining the best traits of two dissimilar components. In aviation, for instance, their versatility is solving two important problems—providing strength without excessive weight, and heat conduction without corrosion at extremely high temperatures. Aluminum-clad duraluminum ribs and spars add strength to big airplanes like the Navy's big flying boat Mars. And exhaust cones of the same sort of stainless-copper-stainless material used in the new pots and pans is helping to beat the heat and corrosion of the fiery exhaust gases that stream out the tails of giant rockets.

If and when we shoot a rocket to the moon—and the first attempt may not be too far in the future—clad metals will make the trip.

END

Frying pan of copper clad with stainless steel (below) heats so evenly, because of superior heat conductivity, that ends of bacon up on its sides cook just as fast as portions in center.



DDT Toughens Flies

THE U. S. Department of Agriculture reports a complication in the war on insects: their tendency to develop resistance to insecticides. In laboratory tests, stronger and stronger dosages of DDT have been required to kill successive generations of houseflies.

How's Your Plane IQ?

If you're air-minded, you should get a good score on naming these transport planes. Give it a try, then check the answers printed upside down at the bottom of these pages.



1. This new air liner adds 100 miles an hour to older twin-engine transport performance, nearly doubles passenger capacity.



4. Twin-boom tail makes it easy to identify this new Air Force flying boxcar. It can carry 42 fully equipped men or 10 tons of cargo.



5. And here's a triple-tail, four-engine job you've undoubtedly seen many times. It's in regular commercial air-line service today.



8. Here's a veteran of four-engine flight with both the air lines and the military. A prewar entry, it is still going strong.



9. Might be a twin of its neighbor at the left, but is a lot faster. Note the square cabin windows, an identification feature.

6. Douglas DC-3; 7. Martin Mars; 8. Douglas DC-4; 9. Douglas DC-6; 10. Convair XC-99; 11. Convair Liner (240).



2. An 180-passenger Navy giant gets the thrust of six rockets added to the normal 14,000 hp. of its four Wasp Major[®] engines.



3. The double-deck cabin of this big fellow, the largest and fastest commercial land-plane, accommodates 75 passengers.



6. If you're an air traveler, you've probably flown in this popular old-timer. As the C-47, it was a workhorse during the war.



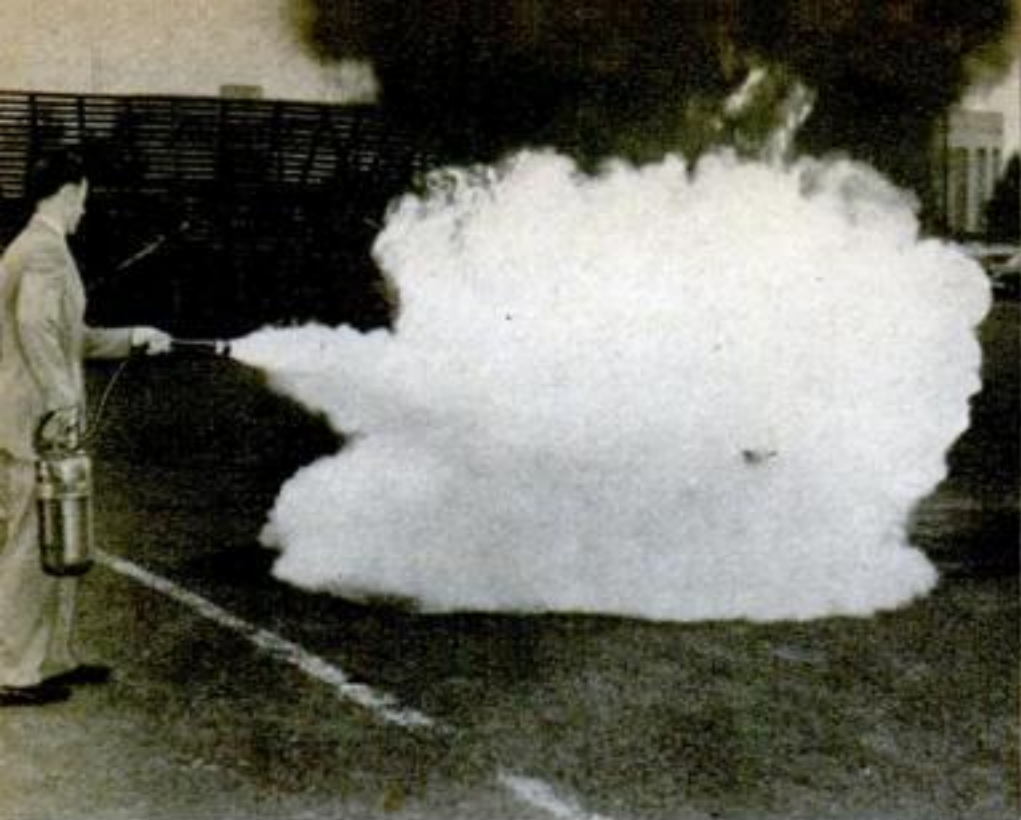
7. The world's largest flying boat in active service, pride of the Navy, recently flew nonstop from Honolulu to Chicago.



10. Presenting the military-transport version of a six-engine Air Force bomber. It can haul 400 men or 50 tons of cargo.

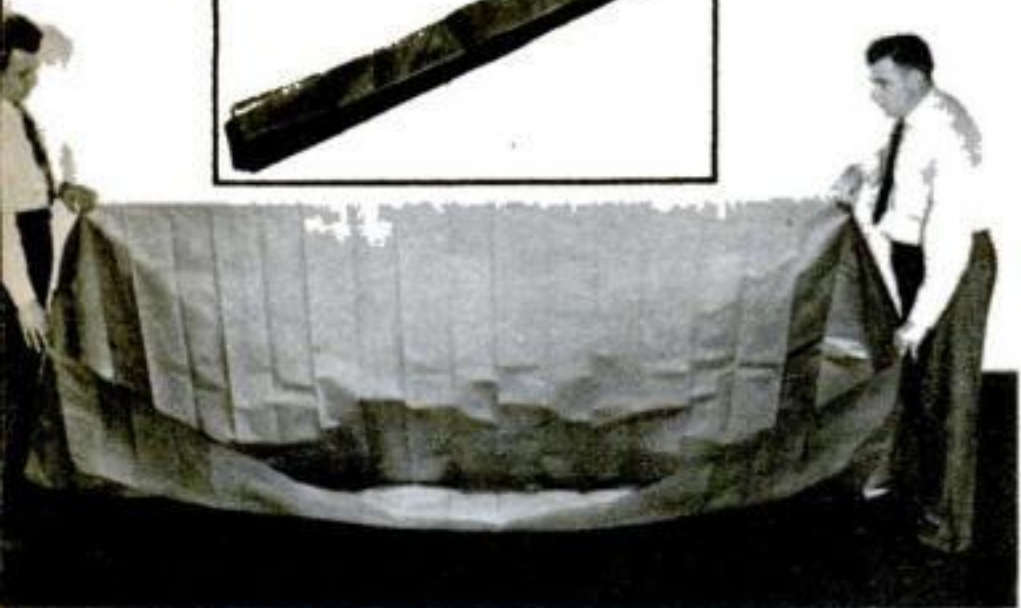


11. Another new entry in the twin-engine field is this 300-m.p.h. medium-range transport now in service on the air lines.



Powder Smothers Gasoline Fire

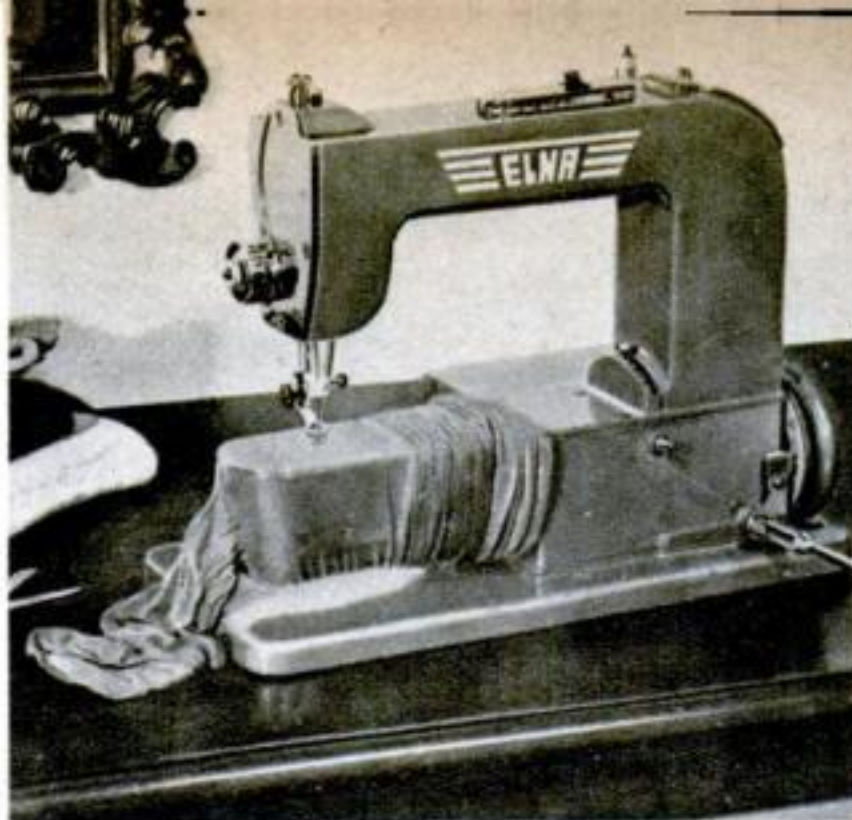
ROARING flames from a tub of gasoline are smothered in seconds by swirling dust from this new Kidde fire extinguisher. Used against flammable-liquid and electrical fires, the gun is loaded with a dry chemical that won't pack or clog. Pulling a trigger pressurizes the powder chamber with carbon dioxide from a side cylinder. Simultaneously, a valve in the chamber top opens, discharging fine powder through hose and nozzle. The stream carries 20 feet to the base of an intense fire despite upward hot-air currents.



Machine Makes Big Paper Bags

THIS outsize paper bag, 5 ft. deep and 24 ft. around, folds into the long strip, only 6 in. wide, shown same scale in the inset photo. Once a costly hand job, making such bags is now done quickly by a machine developed by Sherman Paper Products, of Newton Upper Falls, Mass. Its special trick is the accordion pleating that enables a bag to be snapped open to its full dimensions. The bags are used mostly to protect furniture, caskets, and large appliances from dust during shipment.

160 POPULAR SCIENCE



Light Machine Sews and Darns

HERE'S a very light, portable, electric sewing machine that can even darn stockings. Slipped over a free arm resembling an ironing sleeveboard, as shown above, they are held firm without cumbersome attachments. For flat work, the carrying case fits around the arm to form a table. Swiss-made, the machine has just been introduced in the U.S. by the Elna Corp., of New York. It weighs 14½ lb., is powered by an AC-DC motor controlled by a knee lever, and has several interchangeable sewing feet for a variety of jobs.

New Thread Won't Ravel

A NEW way to make thread by welding the fibers side by side, instead of twisting them together, produces a one-piece strand said not to kink, snarl, split, or ravel. This magnified view compares the nylon Monocord® (right) with twisted thread. The secret process is reported to work with almost any fiber.



Pocket Press Marks Golf Balls

THIS golf-ball marker, small enough to carry in your pocket, can print any name up to 15 letters. Three complete sets of movable type from A to Z come with the press. A container with enough indelible ink for hundreds of balls screws into the back. Made of heat-treated aluminum alloy by Healthways of Hollywood, the new marker sells for \$3.95.

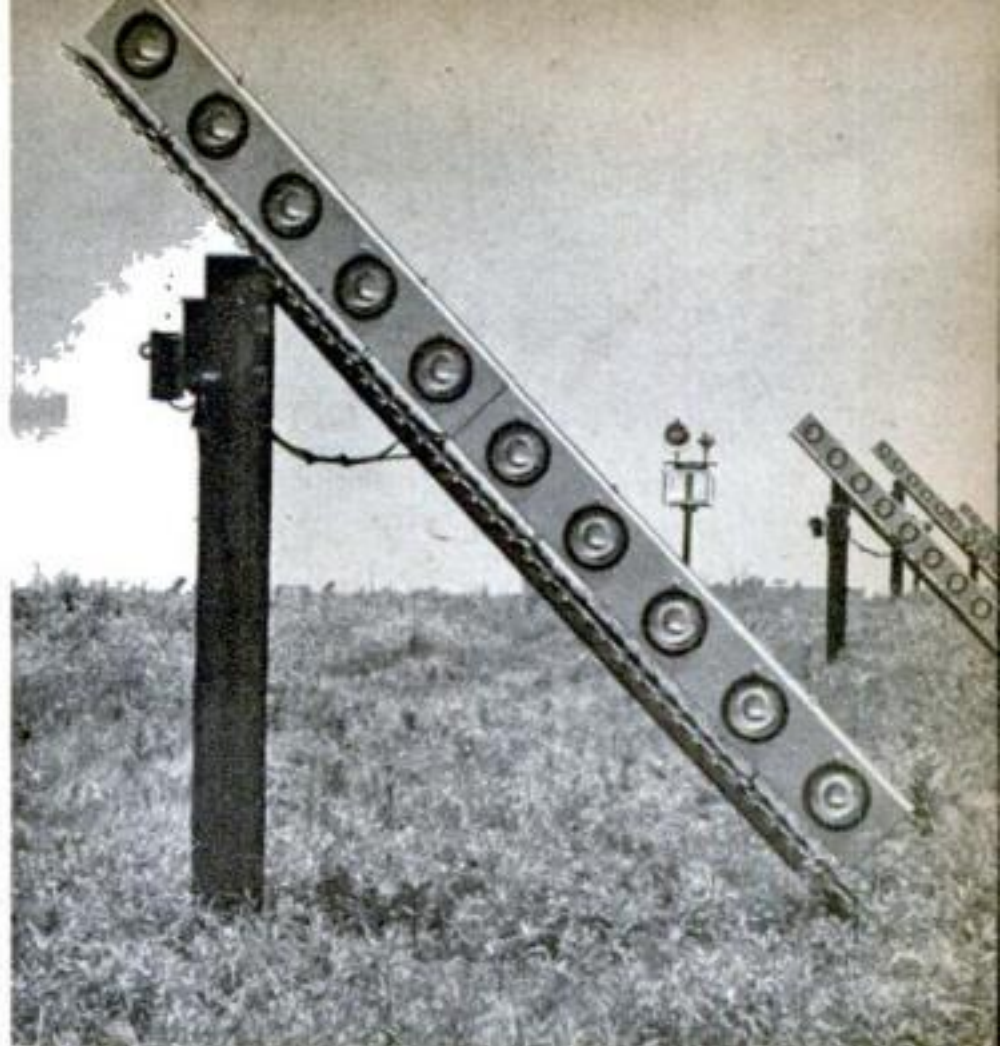


Slope Lights "Funnel" Planes In

COMING down through a fog on instruments, a pilot needs visual guidance during the last few vital seconds that may mean the difference between a safe landing and a crash. A new lighting system developed by the Civil Aeronautics Administration now gives him that last-minute assist. And it does so without his even needing to contact the control tower.

Using this new "slope-line" system, the pilot slips into fog-shrouded runways through a funnel of lights that stand ready not only to tell him when he is off the proper glide path but to show him how to get back on. The funnel is formed by two fixed rows of 30 sloping light units set about 100 feet apart. The rows converge as they approach the runway, forming a V that channels the plane in safely.

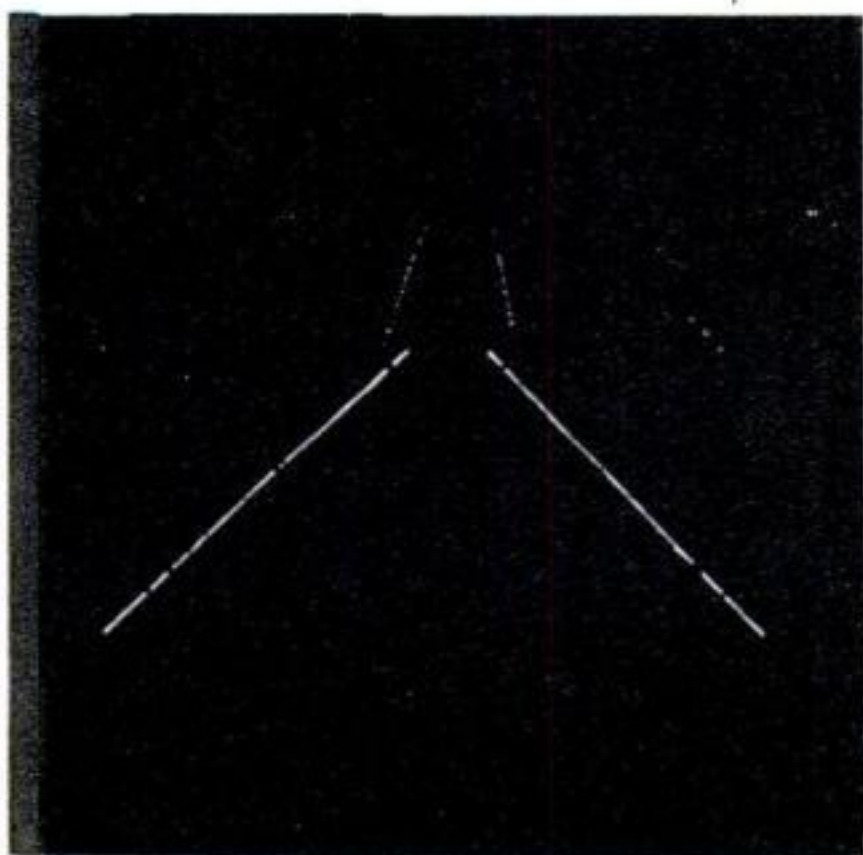
If the pilot is on the proper glide path, the two rows of beacons appear as two continuous strips of light. If he is off to one side, or too low or too high, he sees each row broken into separate bars of light. The relative positions of these bars tell him which



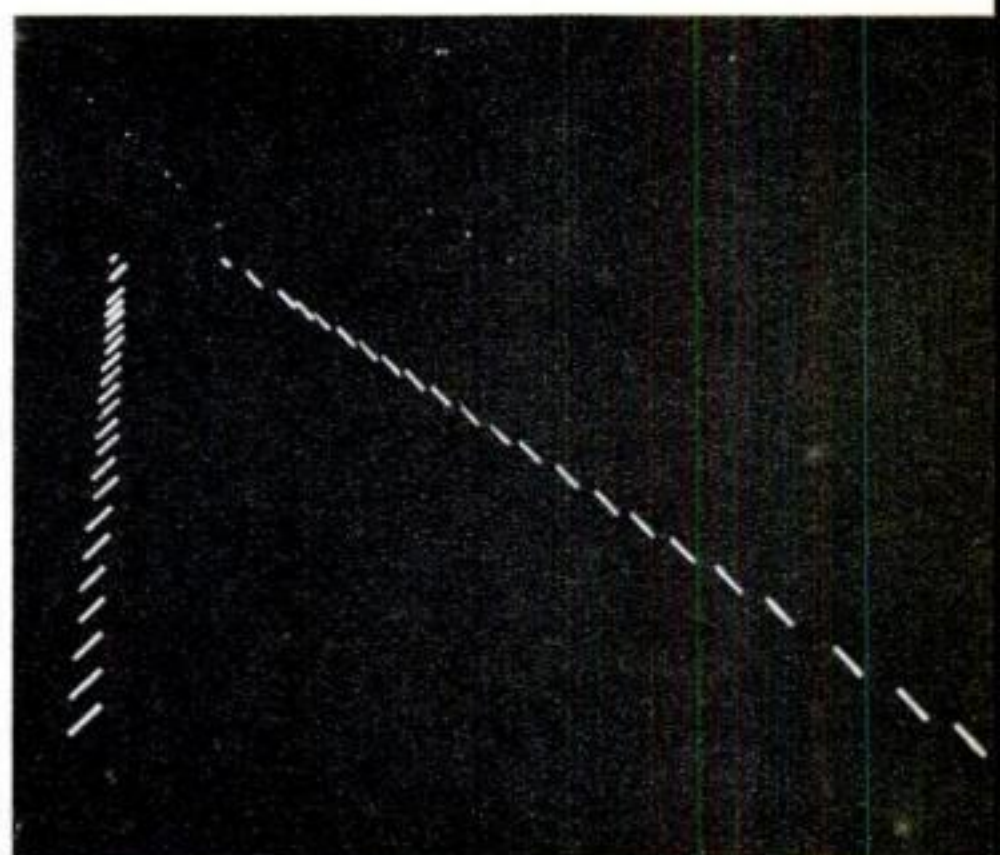
This sloping bank of 10 ordinary automobile headlights is set in a section of war-surplus runway matting. New version, improved since this Indianapolis system, uses 14 sealed-beam lamps.

way to fly to correct his error and get on course.

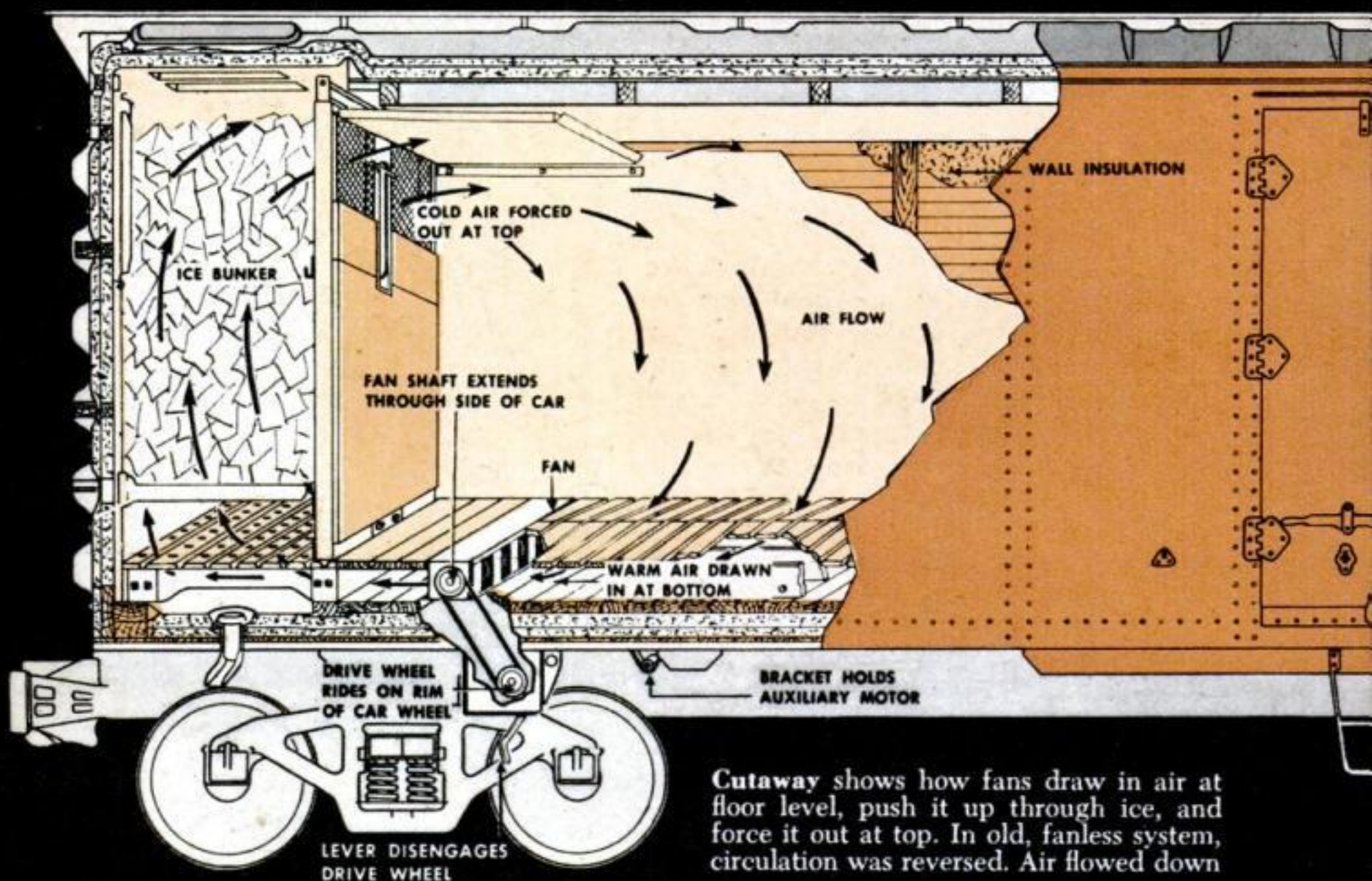
Each light unit consists of a bank of 14 sealed-beam lamps fastened about a foot apart on a strip of steel. These units are fixed to upright posts to form a 45° angle with the ground. The system has been successfully tested at the fogbound Landing Aids Station, at Arcata, Calif., using airplane landing lights of 500 watts, and at Indianapolis with sealed-beam automobile headlights.



Here's how the slope-line lights look to pilot when he's on course and in the approach glide path. He needs only to maintain his present direction into the funnel to reach the runway.



This is what a pilot sees when he's off course to the left. Note how each bar in the left-hand row seems to point to the right, telling him which way to fly to get back on proper course.



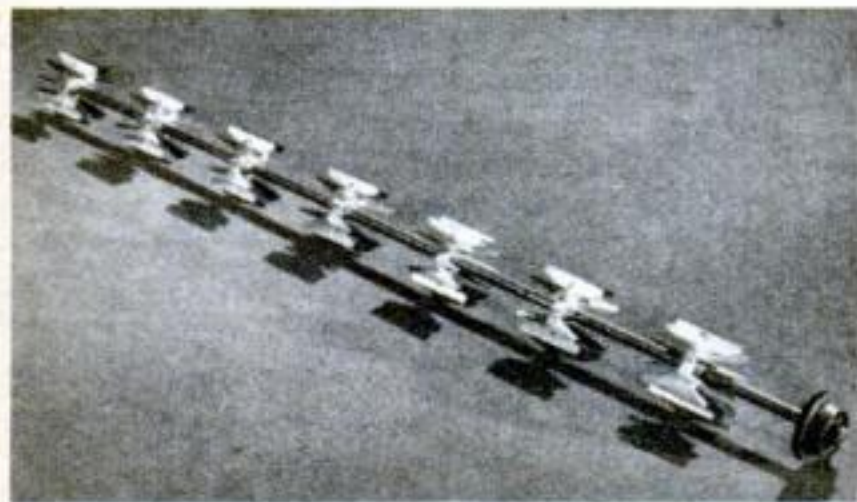
Cutaway shows how fans draw in air at floor level, push it up through ice, and force it out at top. In old, fanless system, circulation was reversed. Air flowed down

Reefer Fans Blow Hot or Cold

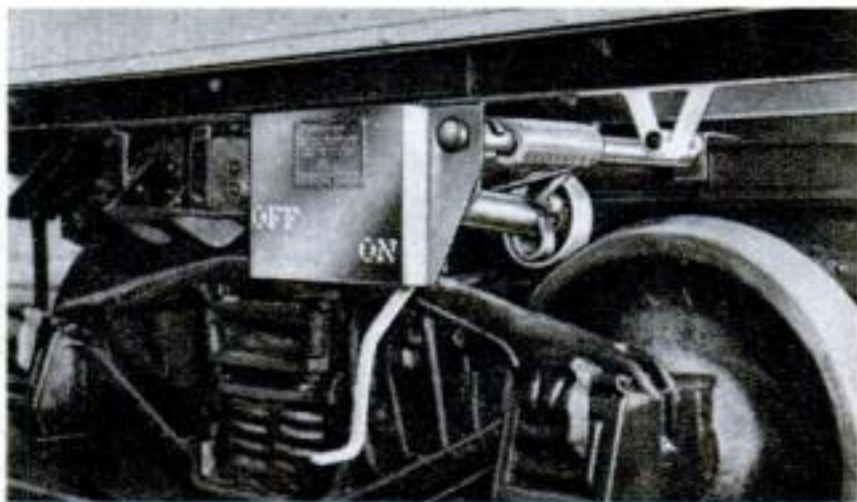
YOU may think it silly to put fans in a refrigerator, but it isn't silly when it comes to big railroad refrigerator cars. Because hot air rises and cold air settles, the ordinary reefer is always warmer at the top than at the bottom. Now two small fans provide a forced-air circulation that keeps the

temperature even throughout the entire car.

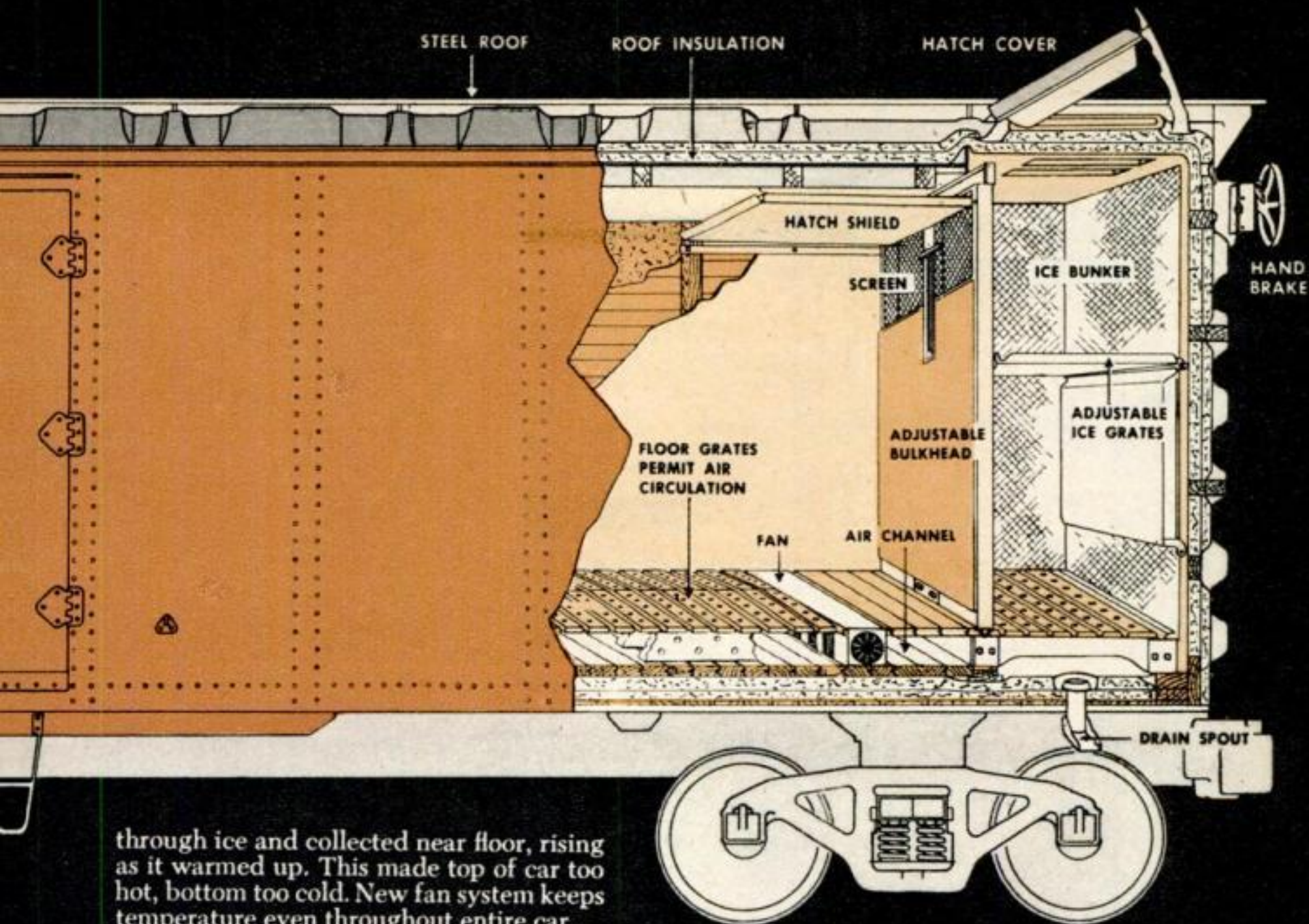
The fans do another job. When sub-zero weather threatens to freeze food despite the car's insulation, small heaters replace the ice, and warm air is circulated. Made by Preco, Inc., the fans are already in 25,000 cars and are going into 600 others a month.



Fans' blades are series of tiny paddle wheels extending across each end of car on long shafts.



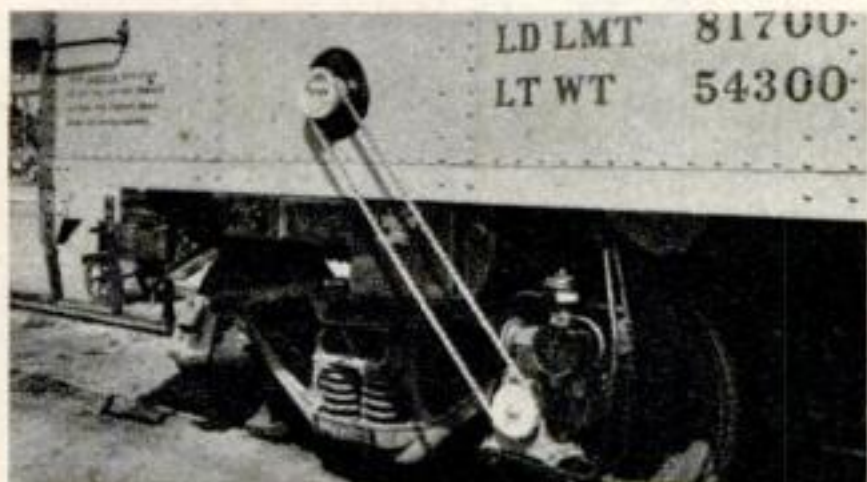
When car is moving, fans get power through small wheel riding on rim of one of car wheels.



through ice and collected near floor, rising as it warmed up. This made top of car too hot, bottom too cold. New fan system keeps temperature even throughout entire car.



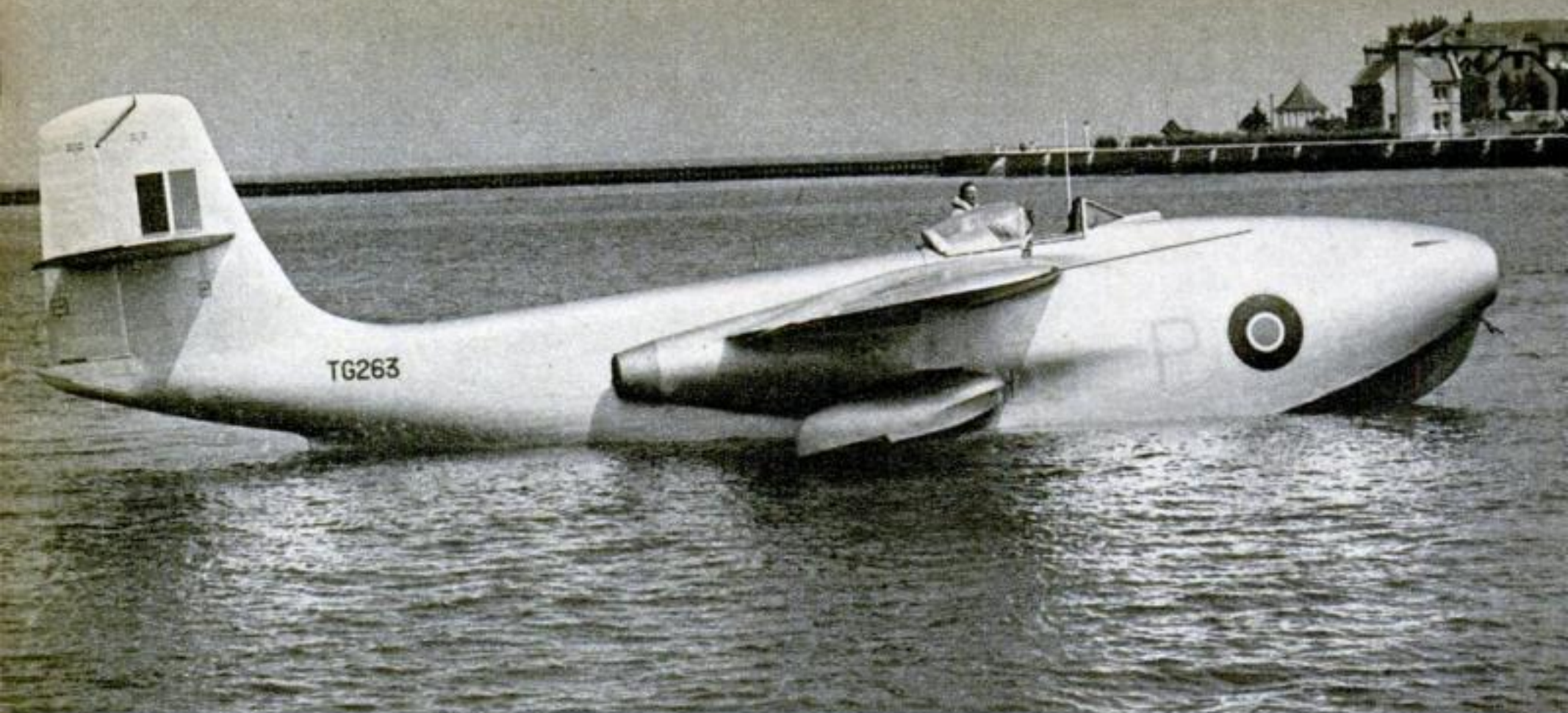
When car is stopped, electric motor is hooked on to keep fans going. Fan shaft sticks out car side.



Where there is no electricity, small, portable gasoline engine can be hooked on in same way.



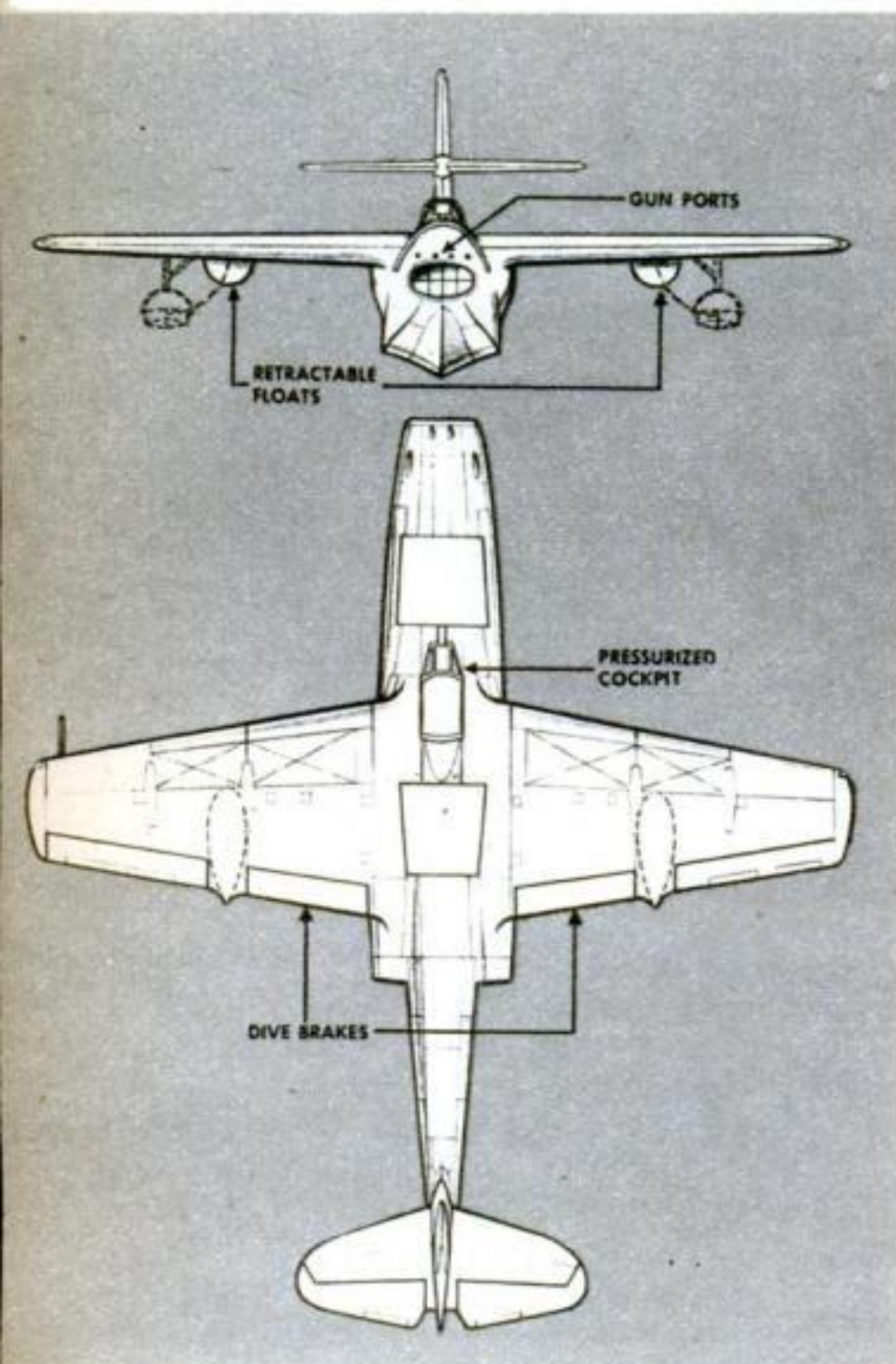
In cold weather, methanol-burning heaters replace ice in bunkers, keep food from freezing.



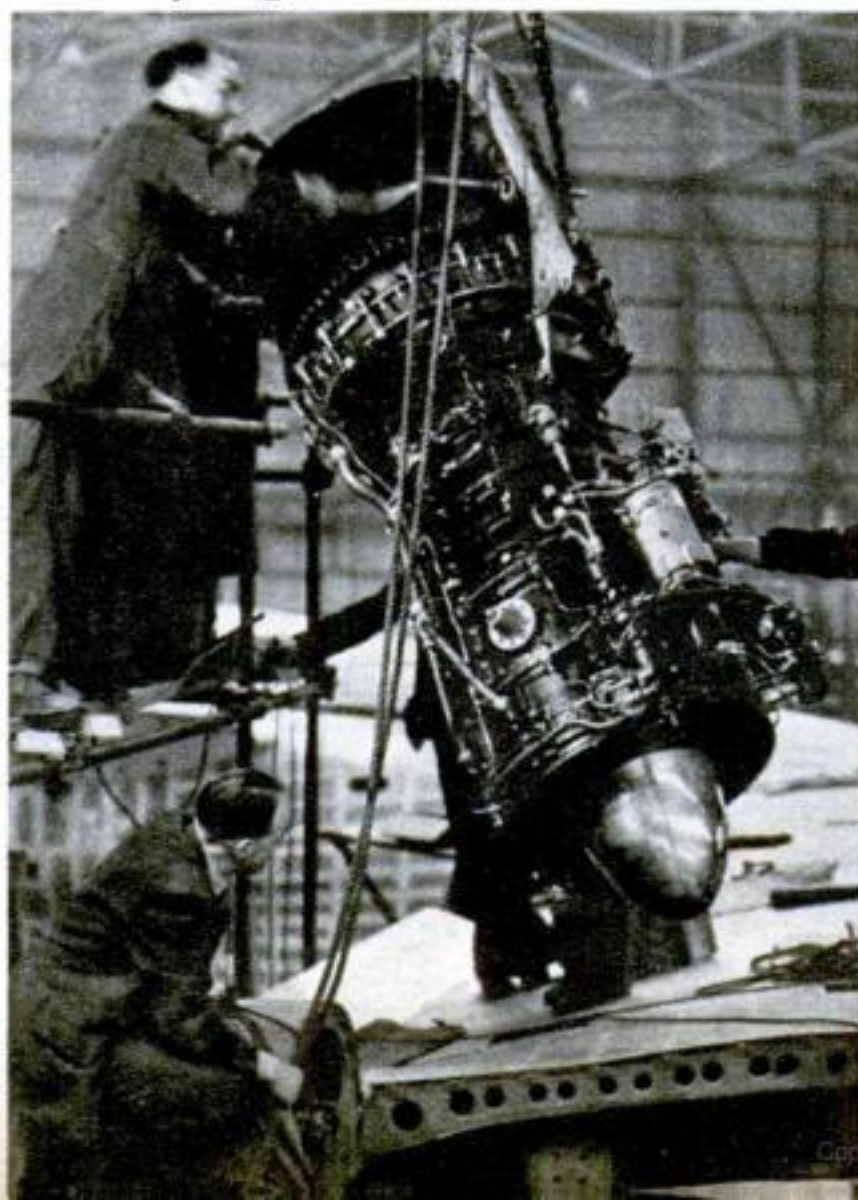
The hull of the S.R./A1 is a floating powerhouse from which protrudes a pair of jet pipes.

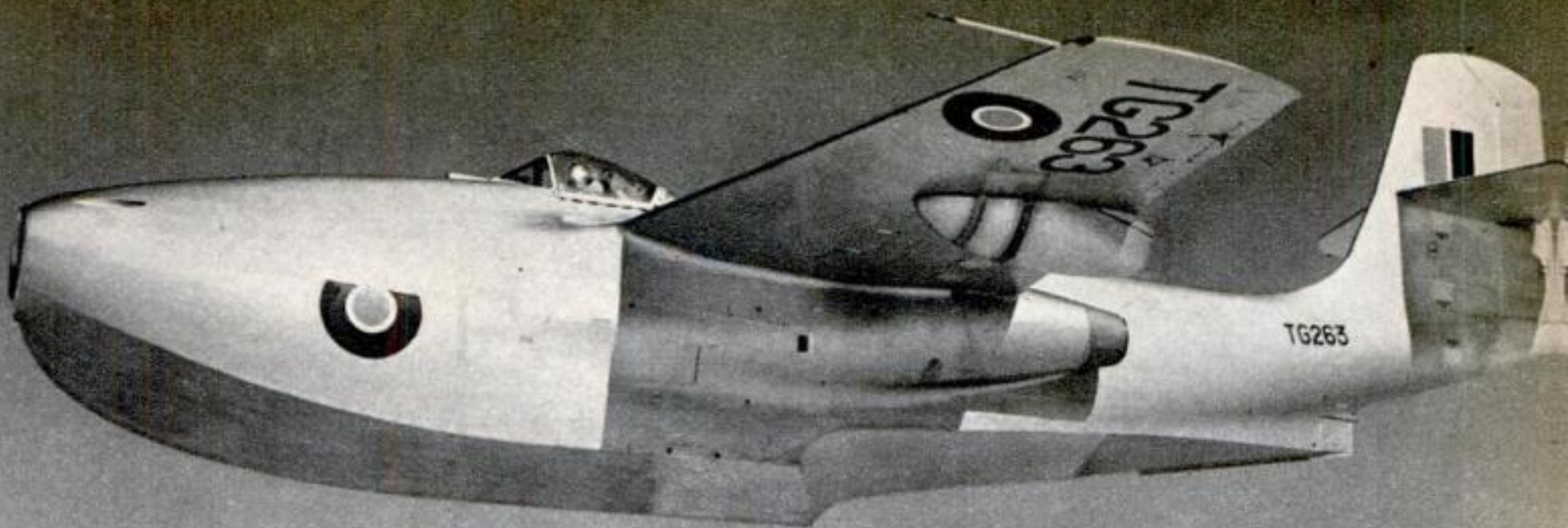
Jets Power First Fighter Flying Boat

Lowering turbojet engine—one of plane's two—into the hull through main hatch is a tricky job. A third prototype of the S.R./A1 has a more powerful Beryl engine rated at 3,850-lb. thrust.



Drawings from *Flight*, of London, show how flying boat's landing floats retract into wings in flight. The new jet plane is 50 feet long and has a wing span of 46 feet; weight is 16,255 pounds.





Jet power, speeding this sleek British flying boat at 500 m.p.h., puts it in the fighter class.

WITH any stretch of water an advanced fighter base, the advantage of a flying-boat fighter is obvious. But it took the power of jet propulsion to give such an aircraft speed and reality: the British Saunders-Roe, pictured above on water and in flight.

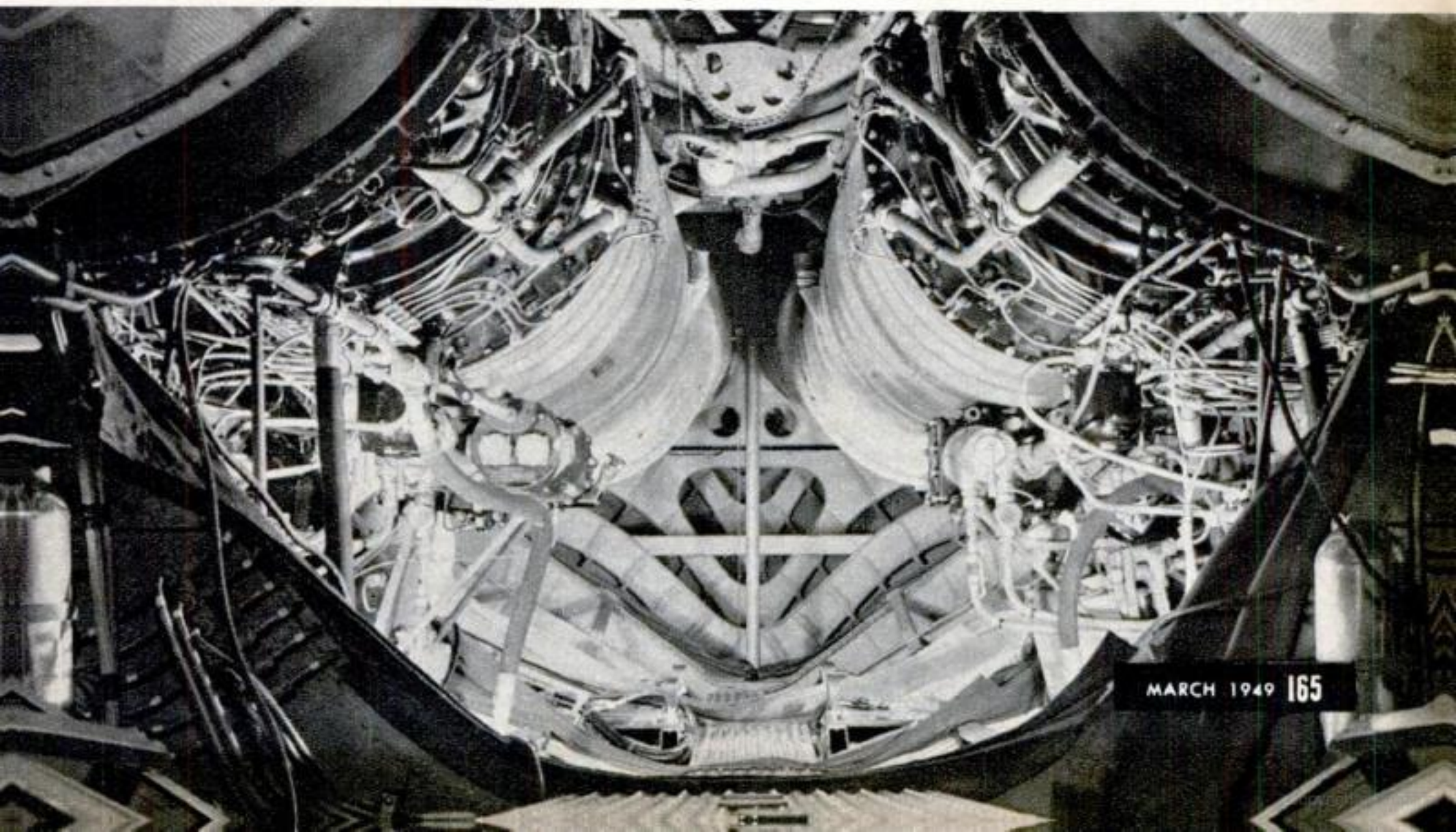
The S.R./A1 (PS, Oct. '47, p. 106) is a twin-jet, single-seat fighter flying boat mounting four 20-mm. cannon ahead of the cockpit and firing over the bow. The wings carry float-retracting mechanism, air brakes, dive-recovery brakes, and landing flaps. Already

thoroughly flight-tested, the first two prototypes have twin Metrovick F. 2/4 turbojets, rated at 3,500-lb. thrust, in a hull engine room. The air intake for both engines is in the nose and has an extensible, power-operated snout to prevent entry of spray or water.

The pilot controls the boat from a pressurized cockpit at the top of the fuselage, sealed off from the hull. The engine room, however, could accommodate one or two engineers who would have access to the engines in flight. Speed is given as 500 m.p.h. **END**

This engine room, although hot and noisy, can accommodate one or two engineers. On 425 gal-

lons of fuel, the plane can cruise for one hour, with 15 minutes of combat and a 10% reserve.



New RR Taps Rich Mine

INDUSTRIALIST Henry Kaiser faced a problem: lack of a rail line across a third of the 150 miles of rugged Southern California terrain from his new iron mine to his new steel mill. Now he has solved it, in his own expansive style, by bridging the gap with the first new railroad built in this country since 1926.

Opened late last year, Kaiser's private railroad carries 1,680 tons of ore a day from open pits in the Eagle Mountains, 1,372 feet above sea level, to the town of Ferrum, 190 feet below sea level, in the Imperial Valley. There this spur line connects with the Southern Pacific for the rest of the trip to the Kaiser steel plant at Fontana.

The new railroad taps a surface deposit of high-grade ore that a survey by the U. S. Bureau of Mines shows will support mining at the present rate of nearly 2,000 tons a day for the next 20 years.

To get there, 52 miles of standard-gauge track—the longest stretch privately built in the U.S. since 1918—span the All-American canal and turbulent Salt Creek, worm up mountain valleys, and cut across the wartime training ground of General Patton's armored divisions. Construction problems included keeping men working in desert temperatures as high as 125° and designing trestles—one 556 feet long—capable of standing up against devastating flash floods.



Diesel-powered shovel loads dump trucks with 5-ton mouthfuls of high-grade iron ore blasted loose from surface vein in California's Eagle Mountains. Trucks make short hauls to a crusher.



Crushed ore is stockpiled by a conveyer whose hinged snout can swing in a semicircle on an arced track to distribute the ore evenly over this huge pile near the new railhead in the mountains.

Kaiser train (below) is loaded with Kaiser ore for Kaiser mill. Conveyer carries ore from bottom

of stockpile and dumps 60 tons into each of 28 cars pulled by a big Diesel-electric locomotive.





Self-inflating pneumatic mattress of nylon, carried by rescuer (inset) to exhausted swimmer,

supports him as he is towed to safety. The long-wearing nylon fabric resists damage by salt water.

Nylon Plays New Roles

HAVE you tried out a nylon carpet on your floor, nylon strings for your ukulele or guitar, or a nylon-faced hammer in your home workshop? Photos on this and the next two pages show these and a dozen more recent applications of Du Pont's synthetic product of coal, air, and water.

Nylon has proved one of the most versatile of modern materials since its introduction a decade ago, first for toothbrush bristles and then in stockings. Its wiry strength, rubber-like elasticity, and resistance to fraying, soiling, and damage from the elements have led to nylon tents, sails, flags, tire cords, rugs,

draperies, upholstery, and garments of every description. But fabrics are not the only materials in which its desirable qualities can be used for improved products.

Obtained in translucent ivory flakes and melted for use, nylon is a true plastic. Besides being spun into filaments for textiles, it may be molded into rods, sheets, or solid objects of any shape. Thus it now yields drinking glasses and nursing-bottle funnels that can be sterilized by boiling water without harm, machine bearings that need no lubrication, translucent armor that guards steel cables from rust, and buttons you don't have to sew on.

Plastic machine parts now are molded of solid nylon. White block at end of the spool of yarn (below), which makes 15,000 revolutions a minute in textile machine, is oil-less nylon bearing.

Nursing-bottle funnel of nylon plastic for preparing baby's formula, now available at five-and-ten-cent stores, is rustless, will not break, and can be sterilized in boiling water without losing shape. ➤





Metal worker's hammer with resilient, durable nylon faces will not mar soft metals. Tested by pounding it with sharp instrument, nylon lasted $2\frac{1}{2}$ times as long as the next best material tried.



Army's new stove-heated tent for Arctic, on exhibition above, applies ability of lightweight nylon to shed the snow and keep heat in. The tent weights only half as much as former types.



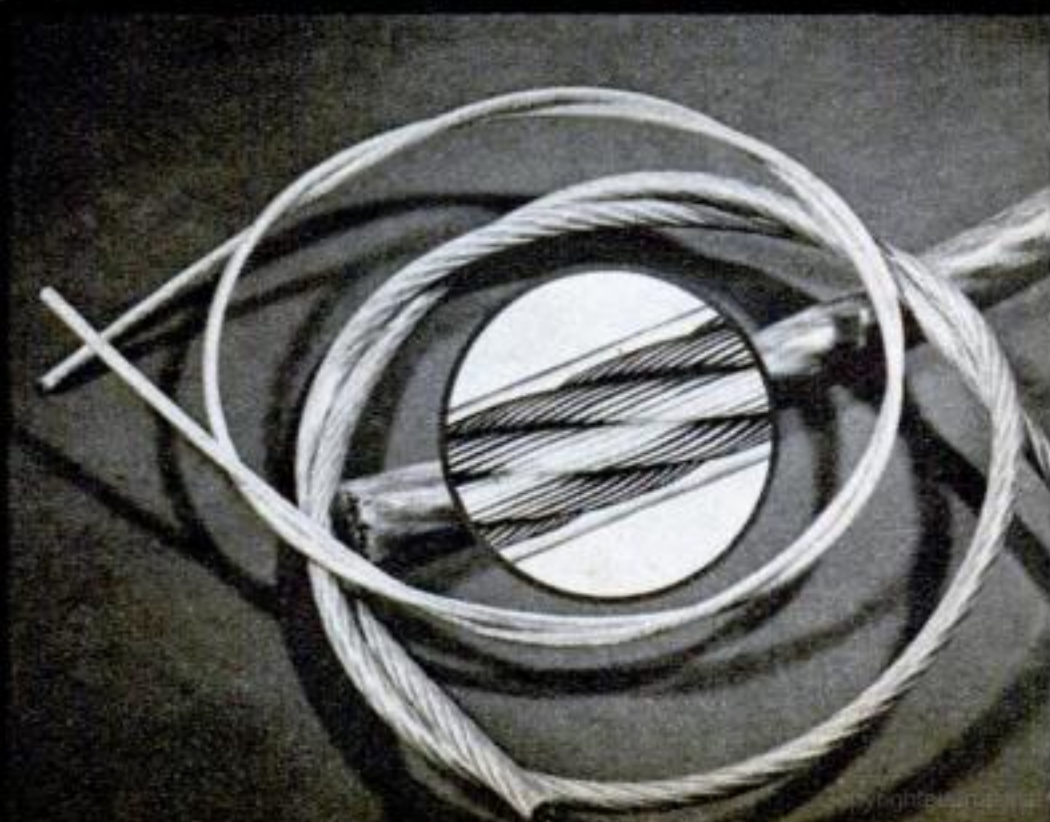
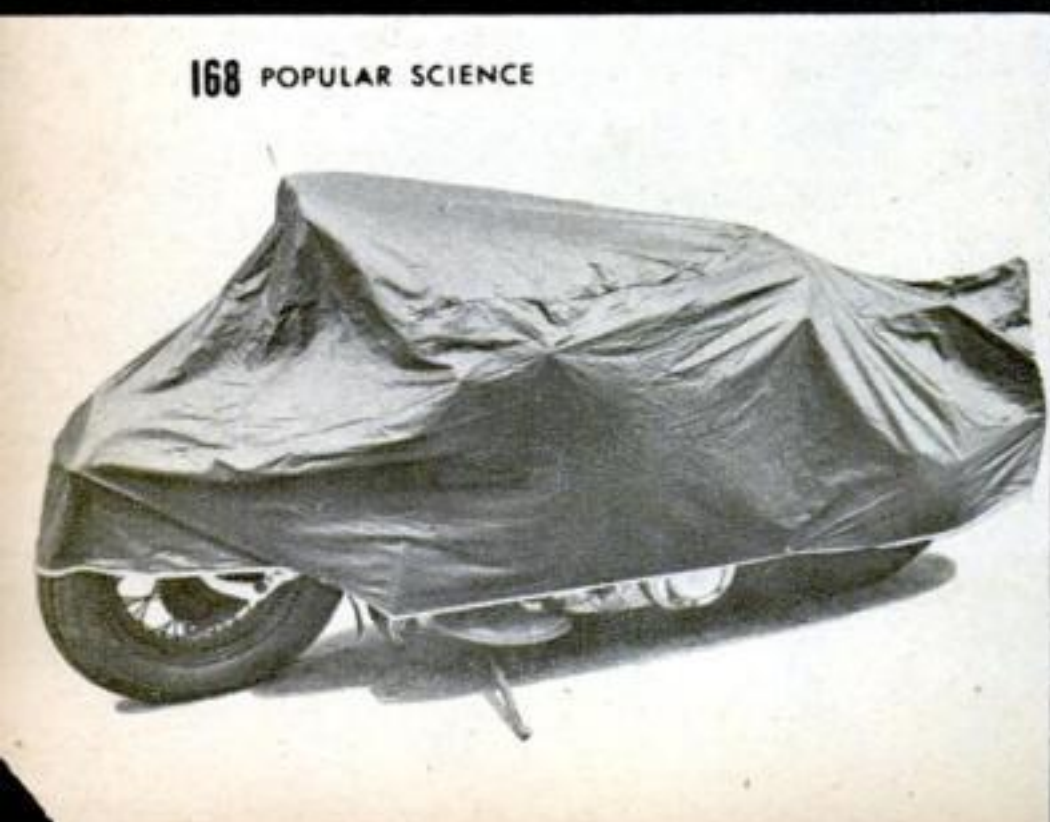
Running water can't harm the strings of this tennis racket, for they're made of waterproof nylon. Tough and elastic, the solid strings have no strands to fray, and defy breakage in use.

Motorcycle is protected by sturdy waterproof cover of nylon (below), especially suited to purpose by high strength and resistance to tearing. Its light weight makes the cover easy to handle.



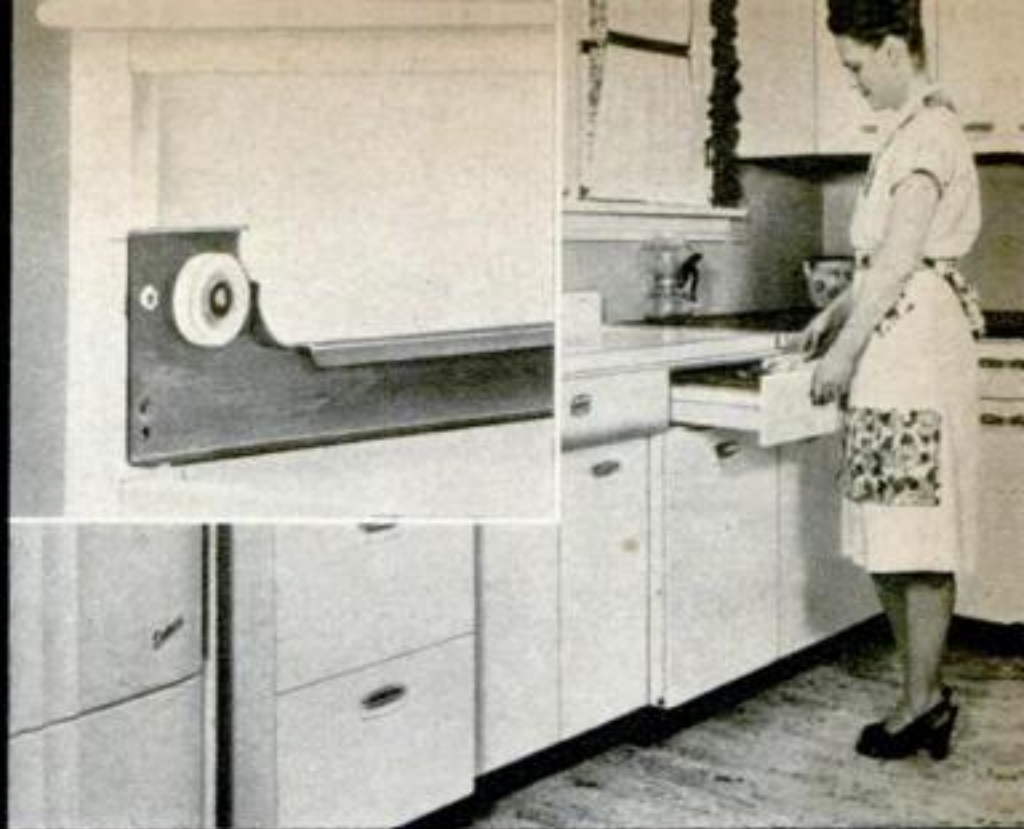
Tumblers of ivory nylon plastic, which don't break when they are dropped and which will withstand the heat of boiling water, are recommended for children and for use in hospitals.

Dog leashes, sash cords, and elevator cables are uses foreseen for Wirelon[®], wire rope with solid translucent-nylon sheath that prevents rust and kinking and thus makes it wear longer.





Nylon strings give superior tone and long life on ukulele, guitar, and harp. They are too smooth for instruments that are played with a bow, but nylon may replace horse hair in violin bows.

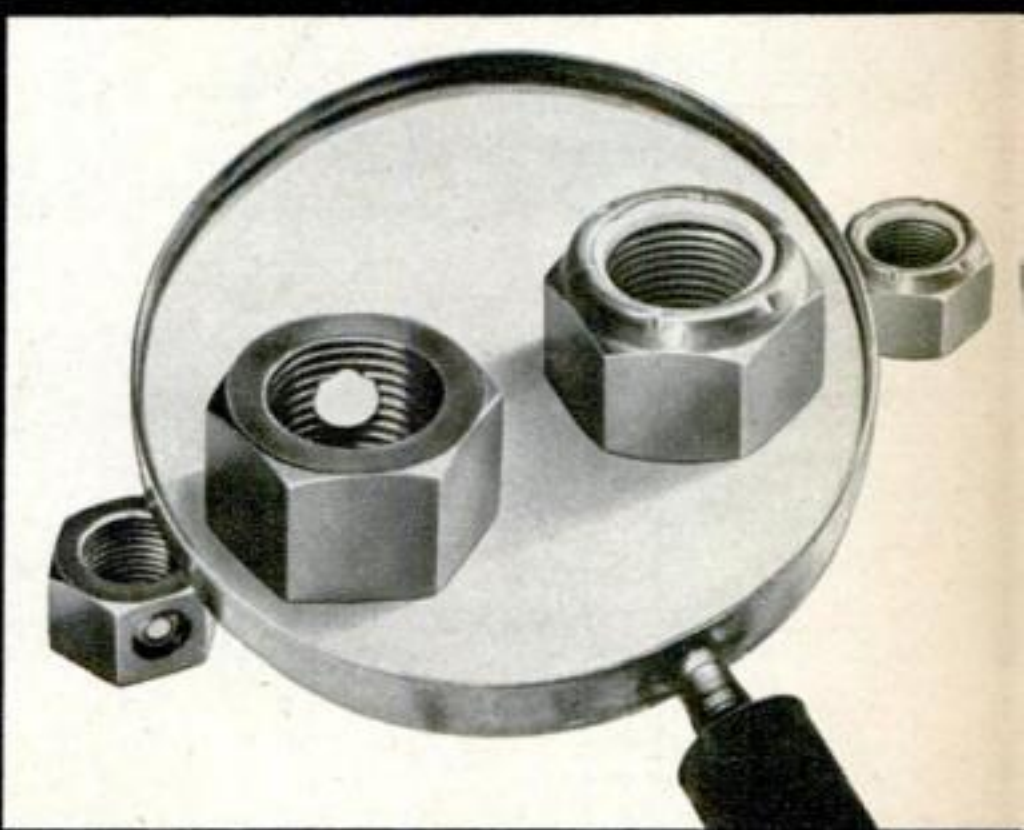


Drawers glide silently and smoothly on nylon rollers, which eliminate metal-to-metal contact and need no lubrication, in new kitchen cabinet, above, made by Geneva Modern Kitchens, Inc.



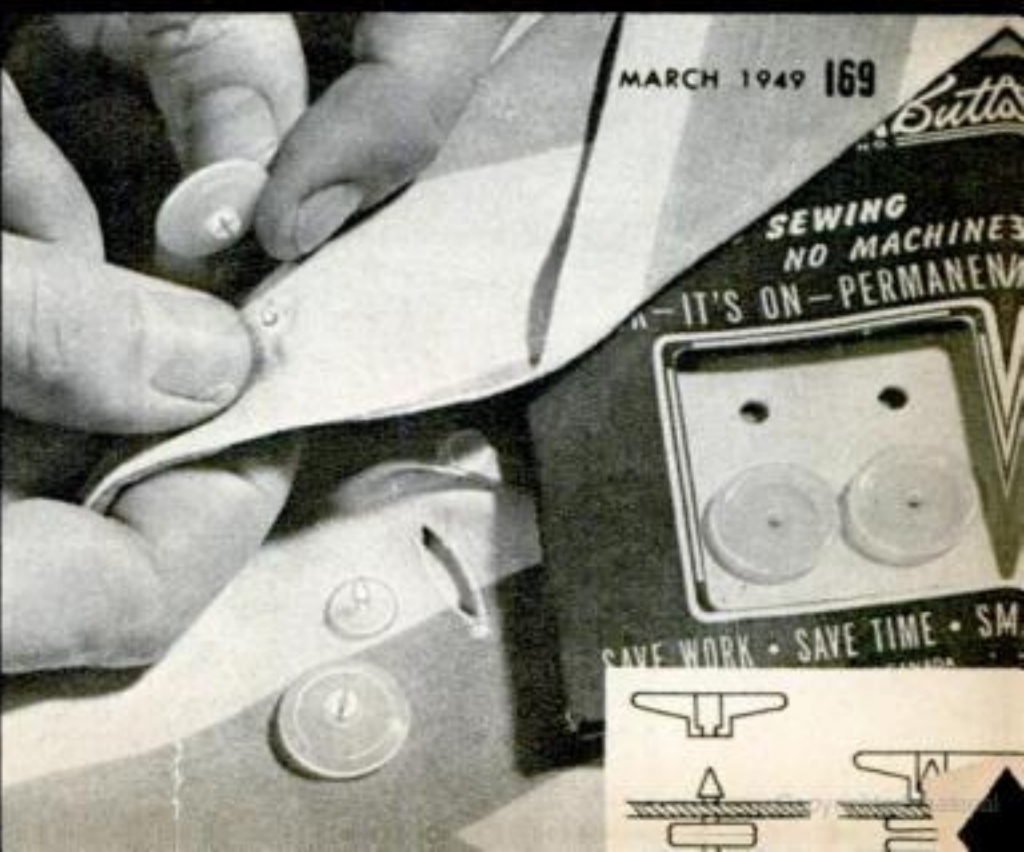
Luxurious carpet for home, recently shown for first time, cushions step with resilience of deep all-nylon pile. Mixtures of wool and nylon, less expensive, are also being used for carpets.

Smallest electric wire ever developed for homes and buildings, a U. S. Rubber Co. product, enables conduit to carry more conductors. Hard shell of nylon protects the rubber insulation.

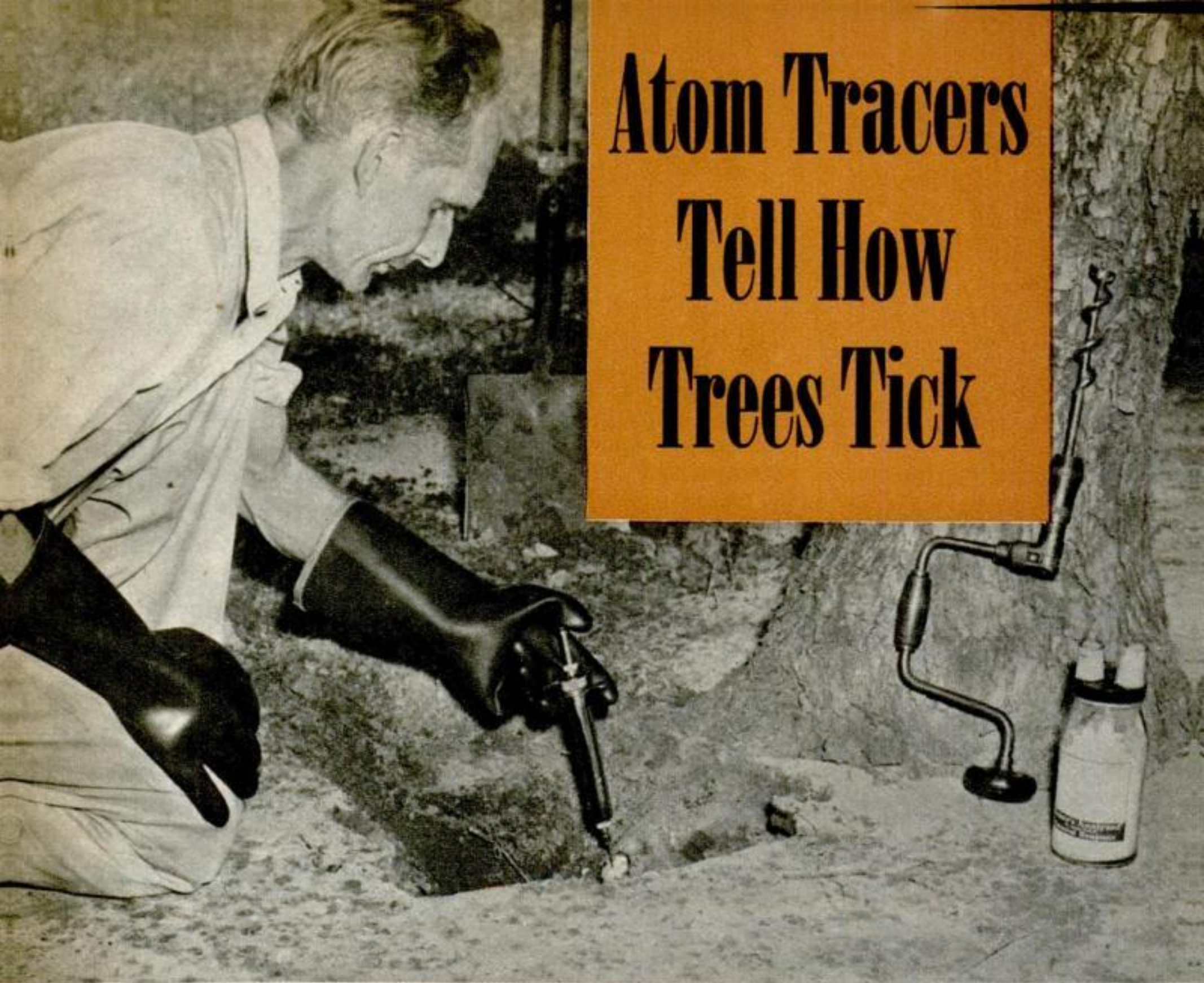


Self-locking nuts, now available, contain a button or ring of nylon bonded to the metal. The resilient plastic grips the bolt threads so tightly that the nut can't work loose and come off.

Handy for bachelors, Butt-On[®] button replaces missing one without use of needle or thread. Its two nylon parts snap together. They withstand laundering and are unaffected by heat of an iron.



Atom Tracers Tell How Trees Tick

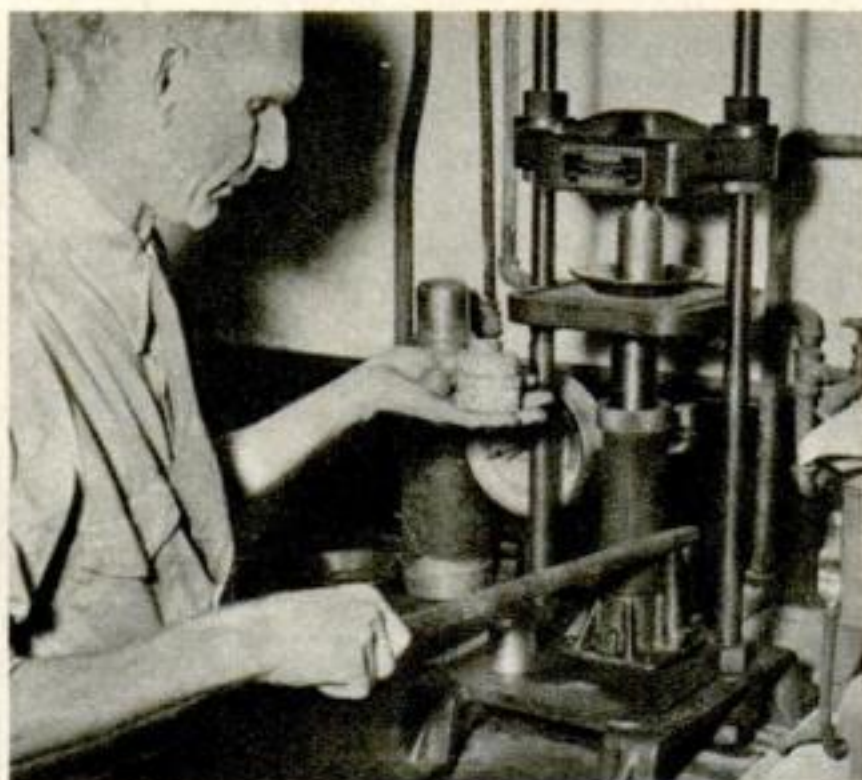


Wearing rubber gloves, Dr. Hammar applies radioactive phosphorus with hypodermic syringe to root of tree in successful test of fertilizing by

injection. Pecan trees near Albany, Ga., were "guinea pigs" for new technique, which may prove beneficial to other varieties of orchard trees.



Radioautograph of pecan-tree leaves, made on photo film in total darkness by telltale rays of radioactive phosphorus, shows fertilizer has reached them and become concentrated in their tips. Thin-sliced specimens of nuts and other parts of tree give similar long-exposure pictures.



Laboratory press, applying pressure of 12,000 pounds to square inch, compresses ground specimens of pecan roots, branches, leaves, and nuts into round wafers that Dr. Hammar holds in hand. These can then be subjected to delicate radioactivity tests with sensitive instruments.

Tests with radioactive fertilizer point way to needle orchards into producing bigger, better, and cheaper crops.

SHOOTING fertilizer into trees with a needle, the way people take vitamin shots, may save countless tons of fertilizer yet yield more and better orchard crops.

That's the promise held out by the amazing results of the first use of radioactive tracers to study what happens inside trees, just as doctors now use such atomic-energy products in medical research.

In the pioneer experiments, conducted by Dr. H. E. Hammar of the U. S. Department of Agriculture, whole trees were made radioactive by feeding them irradiated phosphorus from the atomic pile at Oak Ridge.

Methods of Fertilizing Tested

The tests compared the results of conventional and unconventional ways of fertilizing pecan trees near Albany, Ga. Phosphorus, widely used in phosphate fertilizers, was chosen for the study because of the convenient 14.3-day half life of its radioactive form. This is long enough for the experiments but short enough so that the radioactivity rapidly disappears and requires no prolonged safety precautions. Dr. Hammar's preparation consisted of powdered fertilizer containing ray-emitting phosphorus 32.

Two pecan trees received 10 pounds each of this dry preparation, mixed with soil and placed around their roots. Then, using a hypodermic syringe and a liquid solution of the fertilizer, Dr. Hammar injected it through holes bored into trunks, limbs, and roots of other trees, closing the holes afterward with corks. He also tried spraying a tree's foliage.

Rays Show How It Spreads

In each case the telltale rays of the fertilizer enabled him to observe its route and rate of progress to each part of the tree.

Outstanding was the advantage shown for fertilizing by injection. Only 1/40 of phosphorus placed around roots may be used, but more than a fourth of phosphorus injected directly into them is absorbed within a week and rapidly reaches every part of the tree.

This method not only would thus save fertilizer but, says Dr. Hammar: "It is logical to believe that farmers soon will be able to control the growth and health of trees to a degree heretofore undreamed of, enabling them to cause larger crops of much finer fruit and nuts."

END

New Aids for The Blind



Music Writer. This pencil guide enables a sightless composer to write music at rate of a page in 12 minutes for simple tune. Symbols are positioned by using cut-outs attached to guide frame. The device and those below are sponsored by the American Foundation for the Blind.



Micrometer. Adapted from the standard design, this instrument works by the user's sense of feel. Larger graduations are noted with fingertips from ridges of adjacent fixed and sliding scales attached to frame. Smaller divisions are "read" from ridges on rotating thimble.



Telescoping Cane. Made of chromium and brass, this walking stick collapses to 12½ in. for carrying hooked inside jacket armhole. Extended, it adjusts to 31½, 37½, or 43½ in. to suit the user's techniques of exploring his surroundings.



Orchardist Farley fires a cloud of pollen into bee-shunned apple tree with 12-gauge shotgun. Even with bees on the job, method will increase orchard's yield up to 50 percent. Four or five shots are enough to pollinate an entire tree, and three men can cover an acre in about an hour.

Shotgun Does Bees' Work

IF YOU'RE out in Washington's Yakima Valley this spring, you may come across L. J. Farley blasting away with a shotgun at the apple trees in his 50-acre orchard. Instead of pellets, though, his shells are filled with pollen. For this is his way of helping out nature at pollenizing time.

He started doing it back in 1943 when bad weather during the short fertilization period was making the bees, which work only when it's warm and sunny, particularly stubborn. Furthermore, pollination by hand, an emergency method requiring large crews of migratory workers, was ruled out by the war-time lack of manpower.

His new method worked so well that now Farley is busier than the bees. Come each spring, he loads up his old 12-gauge with the pollen-laden shells and goes out into the orchard to arrange another "shotgun wedding" of his apple blossoms.



Pollen-bearing blossoms are hand-picked when trees bloom in spring, usually about April 20. Only trees suitable for cross-pollination are selected, and blossoms must be plucked just as petals start to open. Time is now precious, for pollen must be extracted before bloom wilts.

Shielded by canvas windbreak, worker gives blossoms final screening to remove anthers, tiny sacs that hold the pollen. These are cured by slow drying under sun lamps at 70° F. for 48 hours in humidified room. Called bulk pollen, this contains 75 percent anthers, 25 percent pollen.





Assembly-line operation begins as freshly picked blossoms are rushed from orchard to battery of workers who rub them across coarse-mesh screens to remove their petals and expose pollen-bearing anthers. All of blossom except pollen was wasted at first. Now Farley plans to substitute discarded

petals for lycopodium (moss pollen), used as carrying cloud for the apple pollen. If successful—he expects to try it out this spring—it will save time and expense of gathering moss pollen. The brief fertilization period of apple blossoms comes and goes suddenly, lasts only 48 hours.

The bulk pollen is vibrated on fine, 100-mesh screen to sift out pollen. A volume ounce—two tablespoons—yields about 130,000,000 of the tiny, football-shaped pollen grains. The pollen is then mixed, about one part to nine, with moss pollen to act as a carrier. In final step, shown below,

pollen mix is tamped into standard 12-gauge shotgun shells that have part of powder removed to lighten charge. Pads between the powder and the pollen protect the pollen from the blast, and a cotton wad holds mixture in. Each shell contains about 2,600,000 grains of pure pollen.



How a Traffic Signal Works

THOSE traffic signals that madden and protect you at 30,000 U. S. street and highway intersections are really alarm clocks that have been to college.

Not only do they flash the right-colored lights at the right time, and in the right sequence, but they can even correct themselves if their timing gets off schedule.

Heart of the signal is its controller, con-

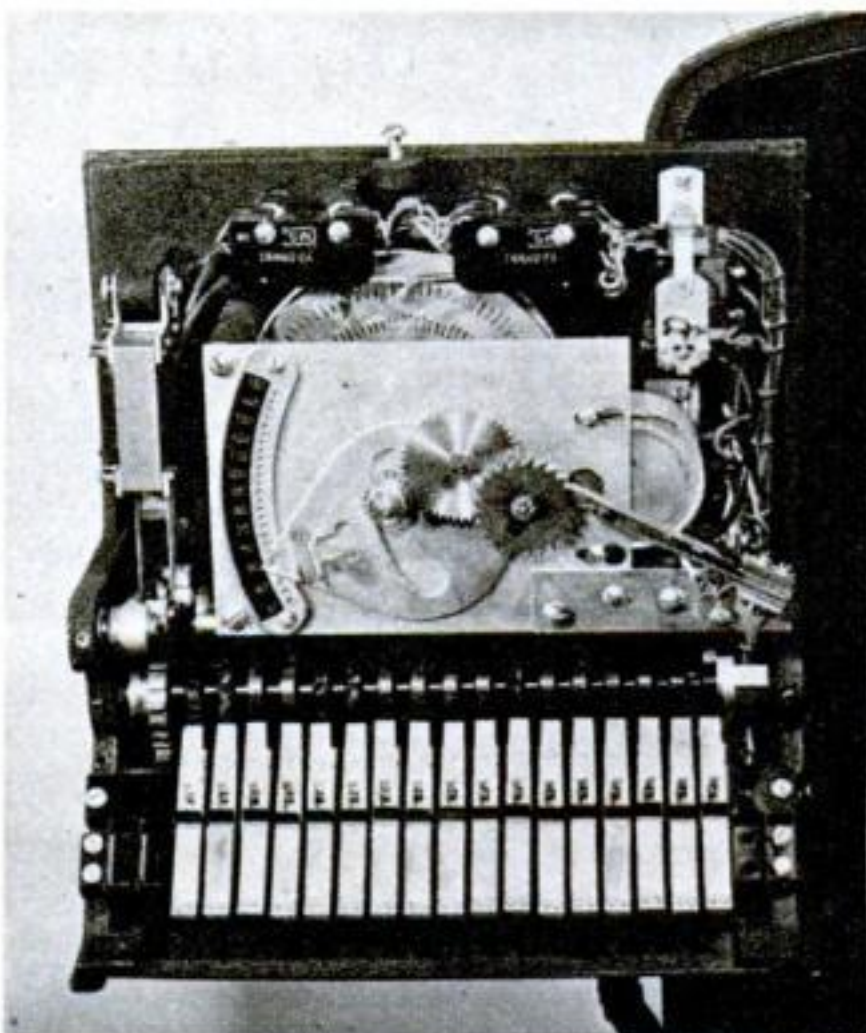
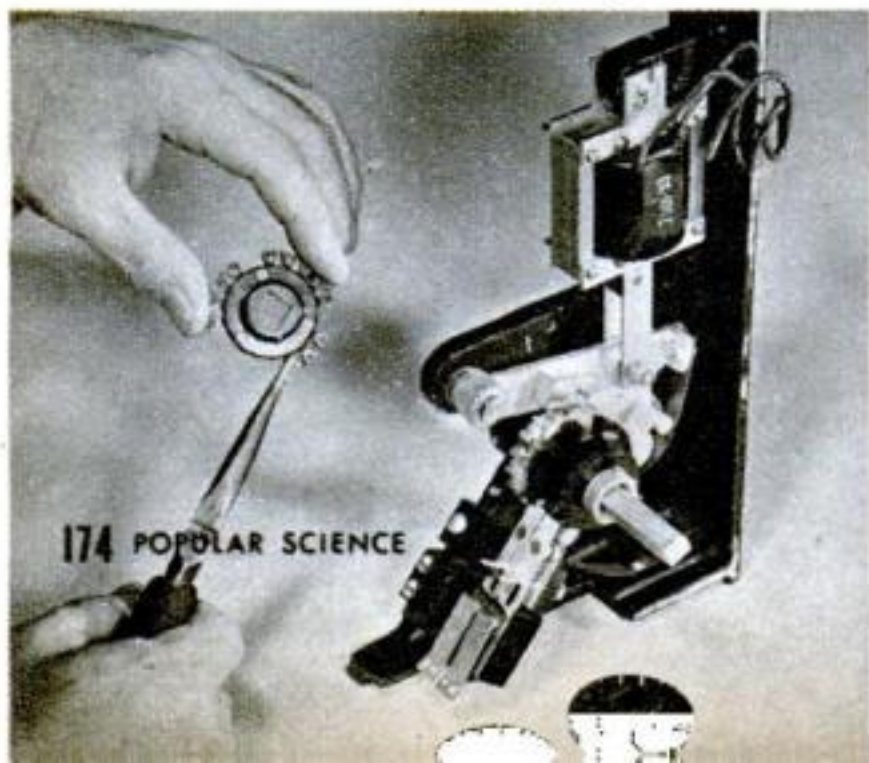
tained in a metal box usually fastened to the light pole. This complex mechanism has two main elements: a timing device, operated by a synchronous motor; and a set of switches, flicked by a series of cams controlled by the timer, to turn the lights on and off.

The signal shown here is made by the Marbelite Co., of New York, one of the larger manufacturers of such devices.



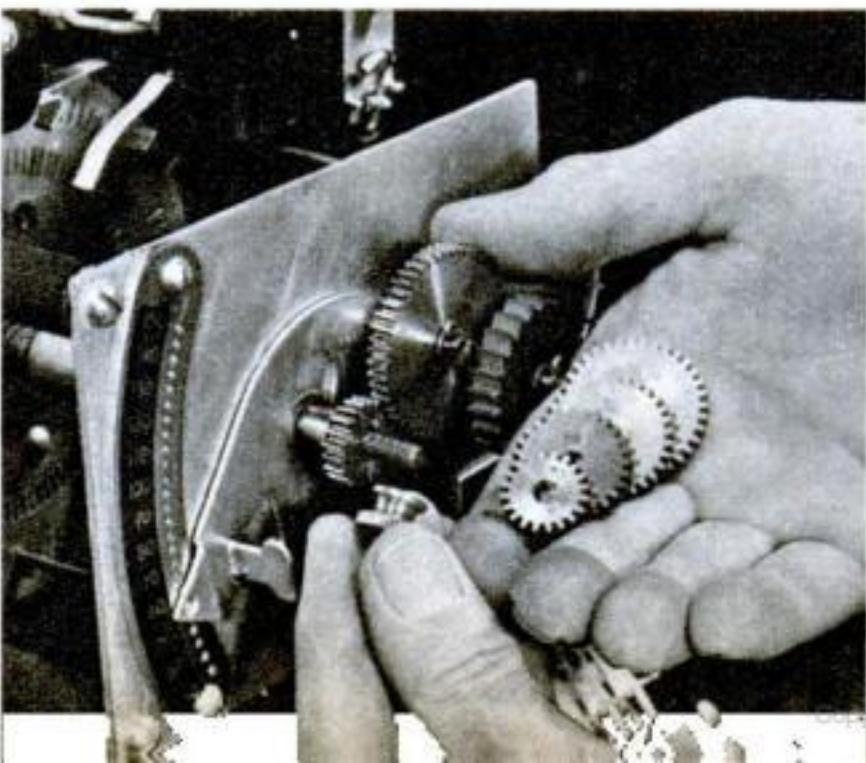
Time intervals for green, amber, and red lights are set by long metal keys fitted through slots on timer's outer circle. Single key on inner circle corrects signal's timing if it gets off schedule.

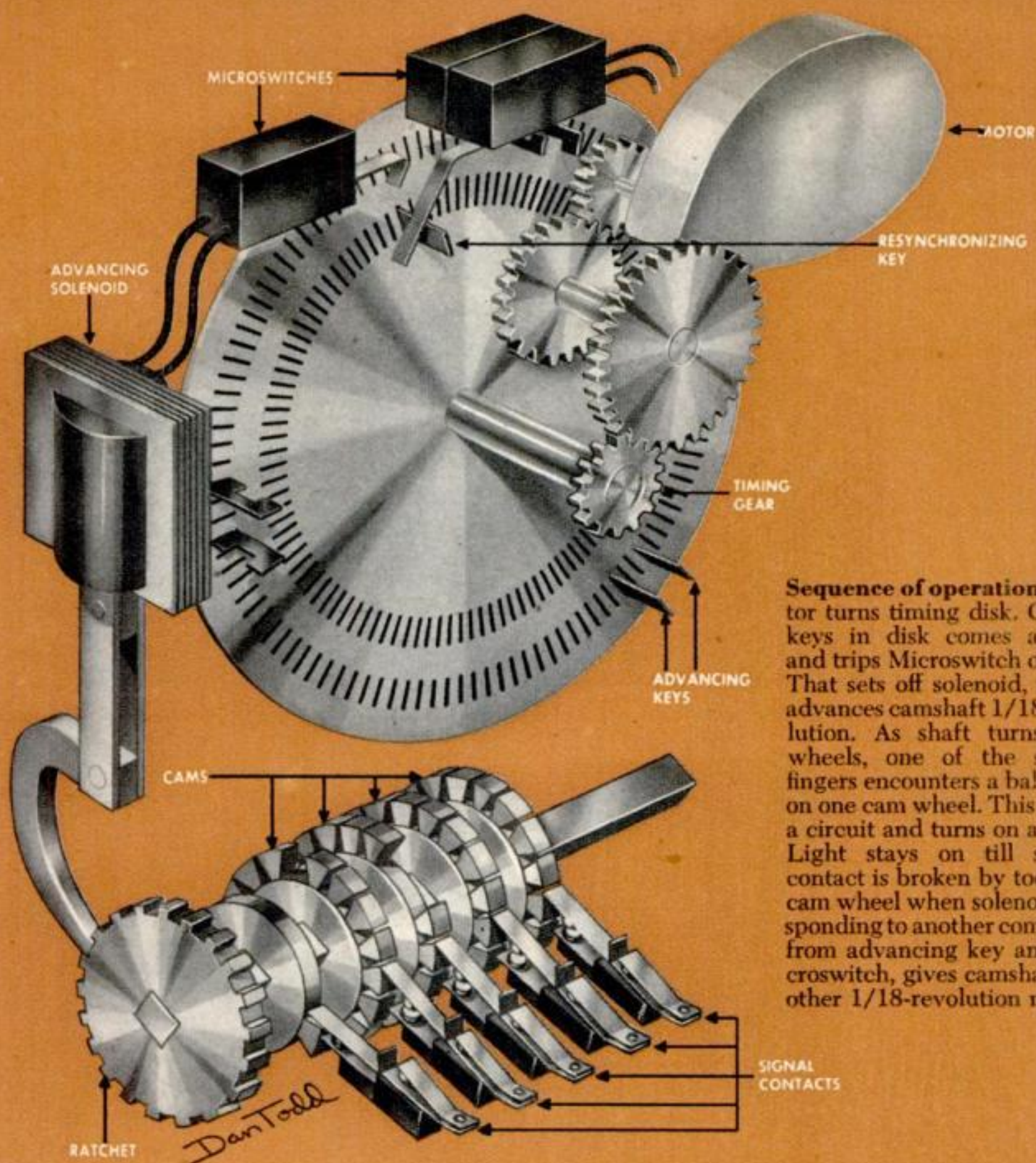
Closeup of solenoid and light switches (below) shows how switches' spring-steel tips finger cam contours to make and break circuits. Circuit closes where tooth on cam wheel (left) is removed.



Back view of controller shows timing disk, motor, reduction gears, Microswitches®, solenoid, camshaft, light switches. The drawing on the opposite page shows how they all work together.

Slip-on gears of different sizes vary length of cycle of the two lights: green-red, red-amber, red-green, amber-red, back to green-red. Gear changes shown below run from 50 to 90 seconds.

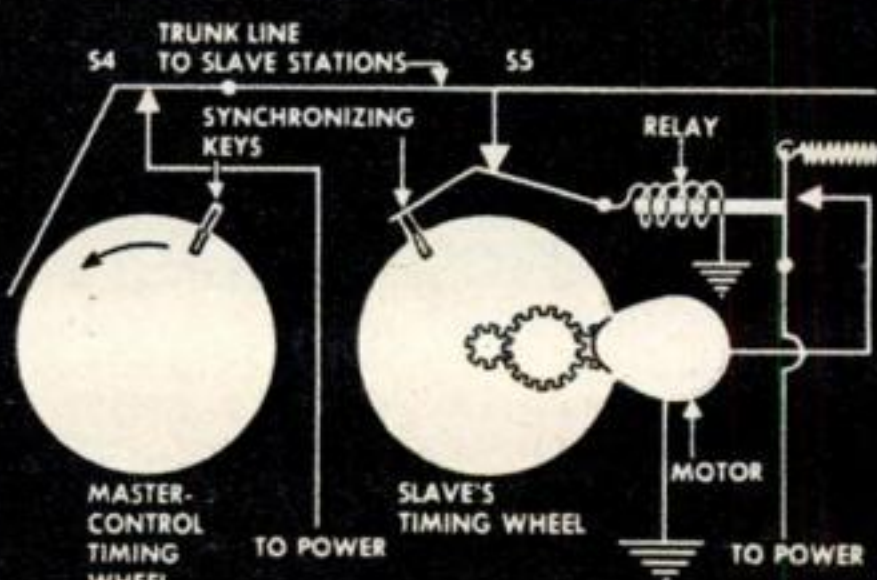
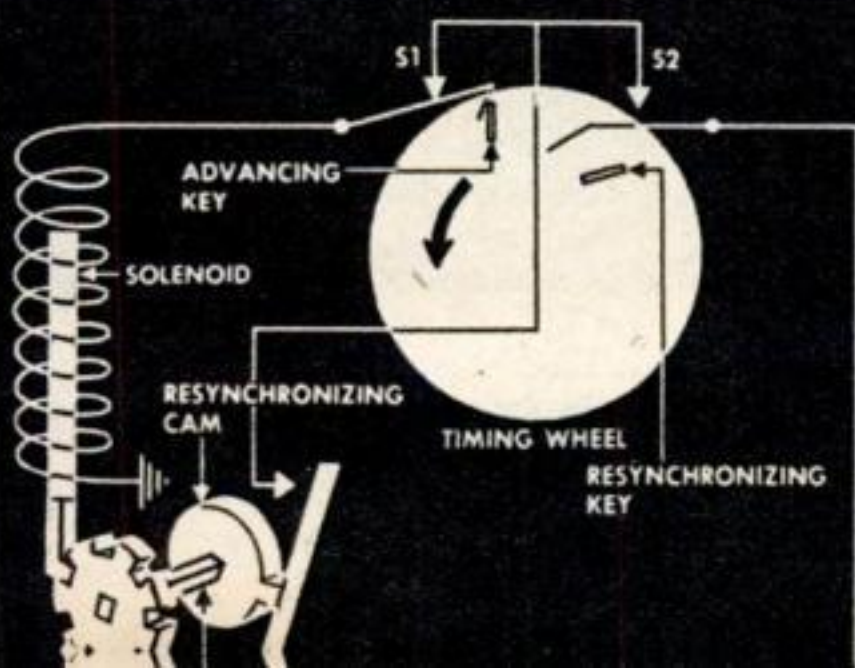




Sequence of operation: Motor turns timing disk. One of keys in disk comes around and trips Microswitch on left. That sets off solenoid, which advances camshaft 1/18 revolution. As shaft turns cam wheels, one of the switch fingers encounters a bald spot on one cam wheel. This closes a circuit and turns on a light. Light stays on till switch contact is broken by tooth on cam wheel when solenoid, responding to another command from advancing key and Microswitch, gives camshaft another 1/18-revolution nudge.

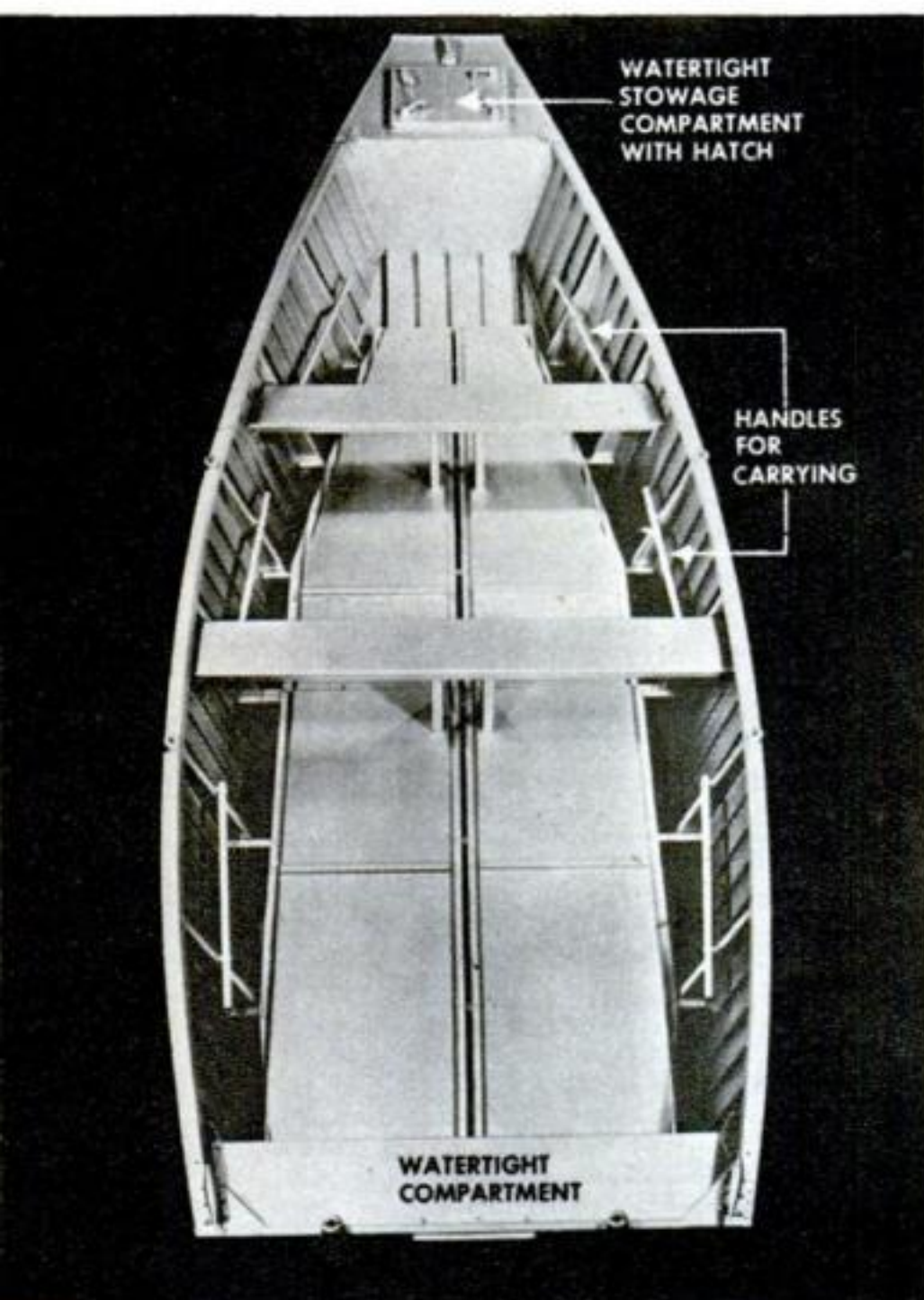
How signal corrects itself: Power to solenoid (below) feeds through S-3 (Switch 3) to S-1, closed by advancing key. Once in each camshaft revolution, a cam opens S-3. If timing is correct, resynchronizing key closes S-2 at same time, completing circuit anyway. If timing is off, open circuit to solenoid halts camshaft till this key comes around. Delay puts the lights back on schedule.

How master control keeps lights on series of intersections working together: If timing wheel at slave station gets out of step with master, its synchronizing key closes S-5, contacting "hot" trunk line fed through S-4. Relay opens power switch to motor. This stops slave's timing wheel until synchronizing key on master opens S-4, allowing the switch to the slave's motor to close.





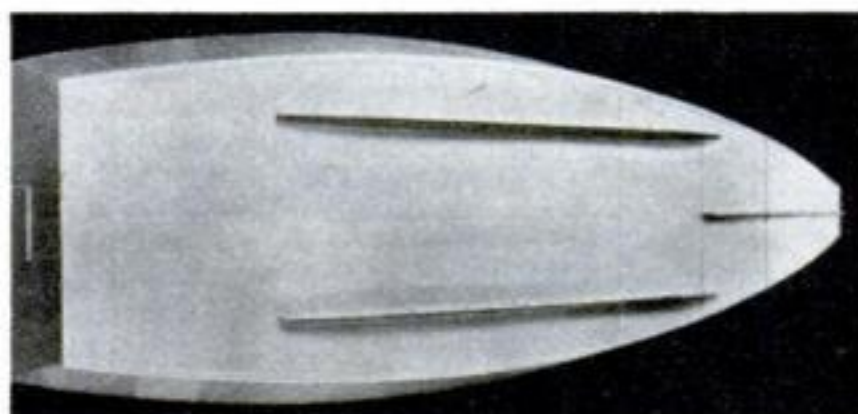
Boat's builders test it under oars and with 10-hp. outboard. Seats and floorboards lift out.



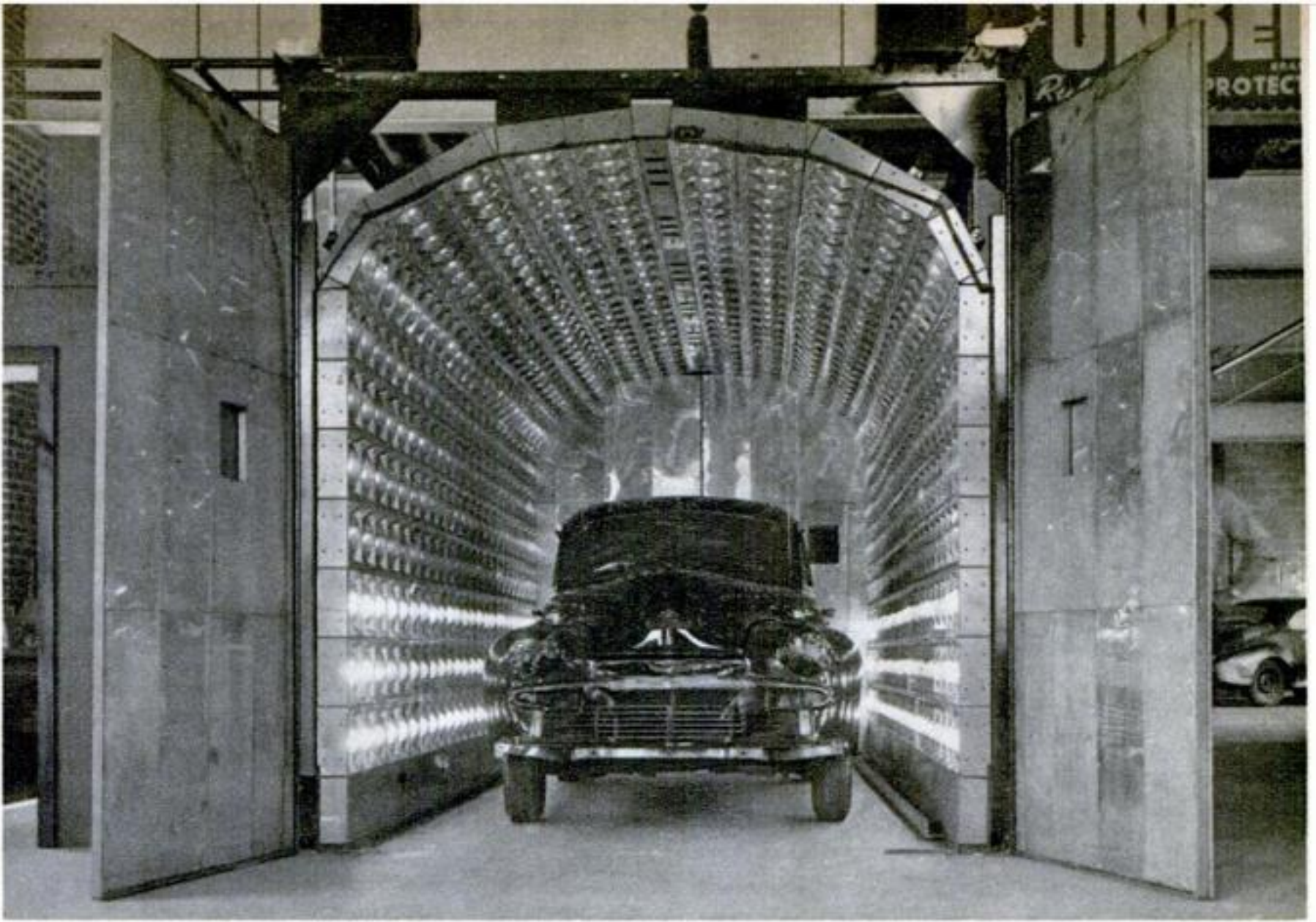
Boat is 18 ft. long and has 6-ft. beam. Fully loaded, it draws 18 in. Six main transverse frames, plus reinforcing stiffeners between, provide rigidity and maximum strength with minimum weight.

380-lb. Boat Can Double As a Sled

THIS aluminum-alloy skiff, now being tested in Arctic inland waterways, is the Army's answer to a sub-zero supply problem. Weighing only 380 lb., it can be carried by its crew of four. Afloat, it carries them plus 3,000 lb. of provisions. Runners along the bottom let it slide easily over snow and ice, while watertight sections fore and aft make the boat unsinkable. The bow compartment is accessible through a hatch for dry stowage.



Bottom is flat for easy handling and dragging over ground. Plastic runners for sliding over snow and ice are replaceable. The versatile new boat is made by the Edo Corp., of College Point, N. Y.



Infrared Oven Bakes New Enamel Finish on Cars

AUTO-BODY refinishing has been speeded up to a one-day job through the use of an infrared baking oven that dries an enamel coat in half an hour at a temperature of approximately 250 deg.

The ovens are being franchised to refinishers in major cities by Durabake Incorporated, Bridgeport, Conn. In addition to speed, the company claims the advantage of lowered labor cost in the processing of a car. After the body preparation it is only necessary to spray on one coat of enamel, as at the right. The car is then placed in the oven (above) for fast drying. No intermediate sanding or spraying is needed, and the usual final buffing is also eliminated.



Conveyor Speeds Car Painting in British Plant

CARRIED through this long spraying booth at the Austin Motor Company, Birmingham, England, car bodies can be painted at the rate of 1,600 a week. Rotary cradles suspended from an overhead conveyor move the bodies down the length of the plant. A counterbalancing arrangement on each cradle permits the body to be rotated by the sprayer so that he can apply the paint at the best working angle; it also allows him to reach otherwise inaccessible surfaces. Installation cost about \$500,000. The plant is manned by seven sprayers.



Gus Gets in Under the Wire

Tricky oil leaks, balky windshield wipers, and something he can't remember give Gus a hard time.

By Martin Bunn

THE morning was gray and gloomy. So was Gus Wilson's mood. He had awakened with an uneasy feeling that there was something important but unpleasant that he must attend to today. He tried to shake off the feeling but it returned with a nagging persistence.

By the time he reached the Model Garage, Gus had a first-class grouch stewing. He snapped a blunt reply to Stan Hick's cheerful greeting and he cut Greg Jones short when the grease monkey began to tell him about last night's basketball game.

Stan and Greg swapped surprised glances and shut up. They spoke to their usually good-natured boss only when it was absolutely necessary. Then they used an icy politeness that was disconcerting to Gus. Before ten o'clock, Stan and Greg had succeeded in making Gus feel like a heel.

As a result, he had worked up a good head of steam when his partner, Joe Clark, stepped out of the office a little while later. Joe was looking at a sheaf of papers he carried and didn't notice the blunt greeting Gus gave him.

"We'd better get this fixed up right now," Joe said, tapping the papers with his pen.

"I haven't time to fool around with a lot of your darn figures today," Gus growled. Even in his usual good humor, Gus detests paper work. "Can't you see I'm busy?" he went on. "Shop full of cars and they're all rush jobs—according to the owners."

"But . . ." Joe began.

"I don't care what it is," Gus cut in. "Whatever you've got, it'll have to wait until tomorrow—as far as I'm concerned, anyhow."

"Tomorrow'll be too late," his partner snapped, getting his hackles up.

Gus mumbled something that Joe couldn't make out and went on pulling the chain hoist.



"I don't care what it is," Gus cut in. "Whatever you've got, it'll have to wait until tomorrow."

Joe watched him for half a minute and then grinned sourly.

"All right, if that's the way you feel about it."

"That's the way I feel about it," Gus replied shortly.

Joe spun on his heel and marched back into the office, his back as stiff as a ramrod.

From that point on things got worse. The



day dragged along slowly and gloomily. One thing after another went wrong. By lunch time, Stan and Greg were snarling at each other. Gus knew it was his fault but somehow he couldn't bring himself to make the friendly overtures he knew would break the tension. Still burrowing in the back of his mind was the consciousness of something that had to be done today, but he couldn't bring it to the

surface. Every now and then he'd stop his work and try to concentrate on remembering it.

About four o'clock a horn blared outside. Greg pushed the door aside and an old sedan rolled into the shop. A fat man stepped out of it and began talking before he had both feet on the garage floor.

"After I been driving this bus for nearly ten

years, all of a sudden she turns into an oil hog," he complained. "I put in a quart and the next thing I know it's all gone. Where or how, I don't know, but I'm fed up with always buying oil."

"I'll take a look," Gus said. There's nothing that Gus enjoys more than a trouble hunt so he perked up a bit. "Ever notice any oil under your car after it's been parked—say overnight?" he asked.

"Not a drop," the owner told him. "I lose the oil on the road but I don't know how. Had a complete motor overhaul not long ago. The garage charged me plenty but they swore the car would be as good as new. It was after that she started eating oil."

How Many Ways Can You Lose Oil?

"Stan," Gus called, "come here and give me a hand, will you?"

"What's up, boss?" Stan asked as he came from the rear of the shop.

"Got another of those tricky oil leaks to find," Gus explained as he raised the hood. "Trot around back and see if the tailpipe is oily."

"What's that got to do with it?" the fat man asked.

"The blow-by past the piston rings and valve guides can push oil out of the crankcase," Gus told him, "and it will show up as an oil film in the end of the tailpipe."

"No oil back there," Stan reported.

"Well," Gus sighed, "we've got to do some careful looking."

Evidence suggested that the main-bearing seals were tight. So were the cap screws holding the oil pan. All visible gaskets seemed okay. Gus turned to the clutch housing.

"How could that have anything to do with it?" Stan asked. He'd almost forgotten the earlier unpleasantness.

"If the breather holes in the clutch housing are clogged with mud or grease," Gus answered, "that might cause the clutch assembly to suck oil. But this is okay."

"I didn't know there were so many ways of losing oil," the fat man said.

"There are dozens of ways," Gus said, "and some of them are very tough to find."

"How about that one we had last week?" Stan put in. "The breather pipe."

"Yeah," Gus said, "that was a real tough one. We had to work the paper dodge on it."

"What's this business about the breather pipe and the paper dodge?" the man wanted to know.

"Well," Gus began, "that car had been losing oil, too. I tried every test I knew to find the leak in the shop, but no soap. So we tied a big sheet of heavy wrapping paper under the engine and took the car on a road test. When you come back from a test like that and find oil spots on the paper, you usually can tell where the leak is."

"Yeah?" said the fat man.

"Sure," said Gus. "Just untie the paper and hold it over the engine in the same relative position. Then notice where the spots are and check the engine parts under them."

"It sure found that one," Stan said.

"What was the trouble?" the new customer asked.

"The engine's rear breather pipe," Gus replied. "You never could have found it by checking in the shop. Had to take the car out and run it. When the car was moving, the wind stream across the outlet of the rear breather pipe built up a vacuum in the pipe that caused the oil leakage. A few small holes drilled in the pipe stopped the vacuum from forming and ended the leak. It's a simple cure but a tough leak to locate."

"Maybe that's where my leak is," the owner said.

"Nope," said Gus. "There isn't any oil on the pipe. There would be if you were losing it there. I checked."

"Then let's get started with the paper test," he urged.

"Not so fast," said Gus. "I want to check the oil lines first. Start the engine, Stan." Gus bent over the engine again and began checking the oil lines and fittings. After a few minutes he straightened up.

"Find it?" the owner asked.

"Yep," Gus answered, "here's your oil thief." He pointed to the nut securing the input line to the oil filter. "I found a thin film of oil on this line and it led to the nut. When your engine was reassembled after that overhaul, the nut wasn't tightened enough. That caused a leak when the pressure was high and the oil was warm—say at fairly high-speed road driving. At low speeds or when the oil was cold, the fitting didn't leak. A little tightening will fix it up all right."

Rain Brings More Trouble

"So that's what's been wasting my oil," the fat man groaned. Then as Gus turned from tightening the nut, the man said: "This has been one tough day, hasn't it?"

Gus looked at the fat man closely and then,



without knowing why, he agreed with him.

"Well, I've got it done, anyhow," the man added as he climbed into his car.

"What—the day?" Gus asked.

"Are you kidding?" the man grinned, putting his car into gear.

As the shop door closed behind the old sedan, even the weather took a turn for the worse. The gray murk thickened into an icy rain driven by a howling March wind. Sheets of water lashed down on the highway and rattled against the shop windows.

Before long there was another horn squawking outside the shop door. Stan opened the door to let in a water-streaming coupe with its headlights burning. Joe Williams, the City Alarm's local reporter, jumped out. Gus noticed that Williams, too, looked like he'd had a rough day. What's the matter with everybody, Gus wondered.

"Never thought I'd make it here," Williams said. "What a rain!"

"What happened?" Gus asked.

"Couple of miles up the highway my windshield wipers almost stopped working. I couldn't see where I was going." The reporter glanced at the shop clock and let out a yelp. "For the love of Mike, fix those wipers quick, Gus. I've got to get to the post office to catch the 5:30 mail. It's the last one out."

"I'll do my best," Gus said, "but I never make promises about slow wipers until I find what makes 'em slow. Sometimes you can fix 'em quick, sometimes not."

"This just can't take a long time," the reporter groaned.

Gus Wakes at the Count

While Williams hopped around nervously, Gus checked the wiper hose for air leaks, but found none. He disconnected the wiper motor, examined it, and replaced it. Nothing seemed to be wrong with the motor, but when he switched on the wiper, the blades still swept slowly across the windshield.

"How about it?" Williams asked.

"It might be," Gus said, "that the manifold vacuum is low. Finding out why and fixing it might take a long time."

"I tell you," Williams almost screamed, "that I'll be sunk if I don't catch that 5:30 mail. There must be something you can do. Come on—pull a miracle out of your hat. You've done it before."

While the reporter raved, Gus disconnected the hose. He held it up to the light, looked through it, and laughed. The hose showed no outside bulge but the inch nearest the intake manifold was so swollen inside that the aperture was almost closed. Gus handed the hose to Williams and told him to take a look.

"The heat and manifold fumes broke down the rubber," Gus said. He cut off the swollen section and replaced the hose. The wipers swept back and forth vigorously.

"Open that door!" Williams yelled, jumping into his car. "I'll pay you on my way back. No time now. I've got to catch that mail. If your return isn't postmarked the fifteenth, it means a fine."

Gus watched the coupe shoot out of the shop.

"Return . . . fine . . . what's the matter with that guy?" he muttered. Then it dawned on him. "Holy cow!" he yelled. "Joe! Joe Clark!"

"What's biting you now?" his partner asked from the office door.

"I've forgotten to make out my income tax and it's got to go in today. You'll have to help me. I always get it all balled up. I've known all day there was something that I had to do, but I couldn't . . ."

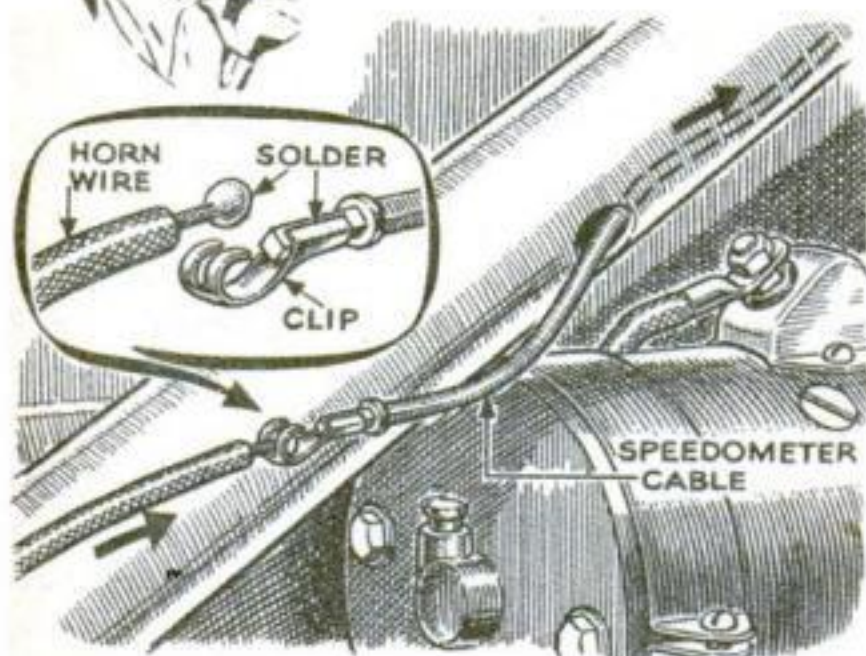
"All you've got to do is sign your name," Joe laughed. "Don't you remember you gave me the dope right after the first of the year? It's made out and I tried to get you to sign it this morning, but you were so crusty that . . ."

"Never mind that now," Gus snapped. "Gimme the blank and a pen. I've got to get that 5:30 mail. You don't want to see me pay a fine, do you?"

END

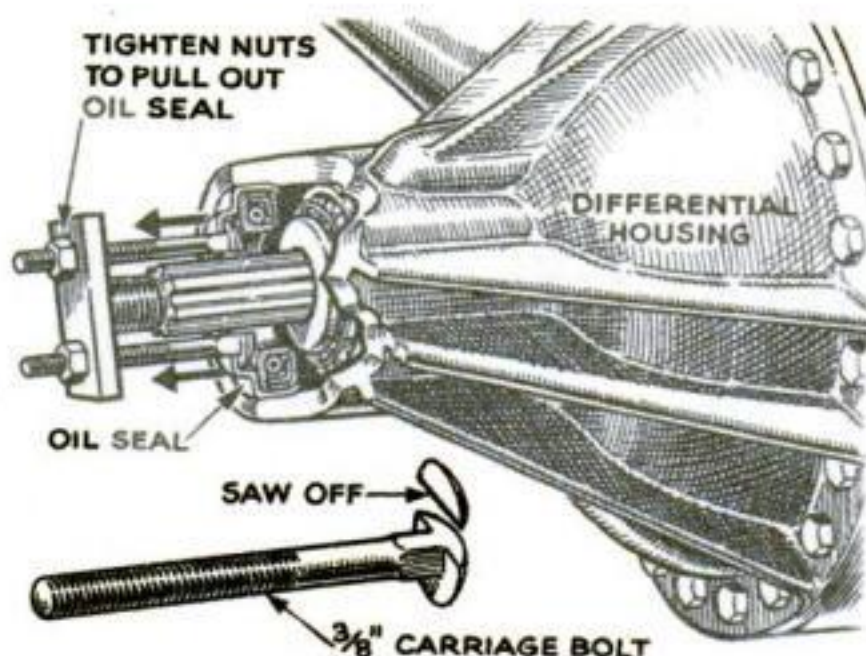


Hints from the Model Garage

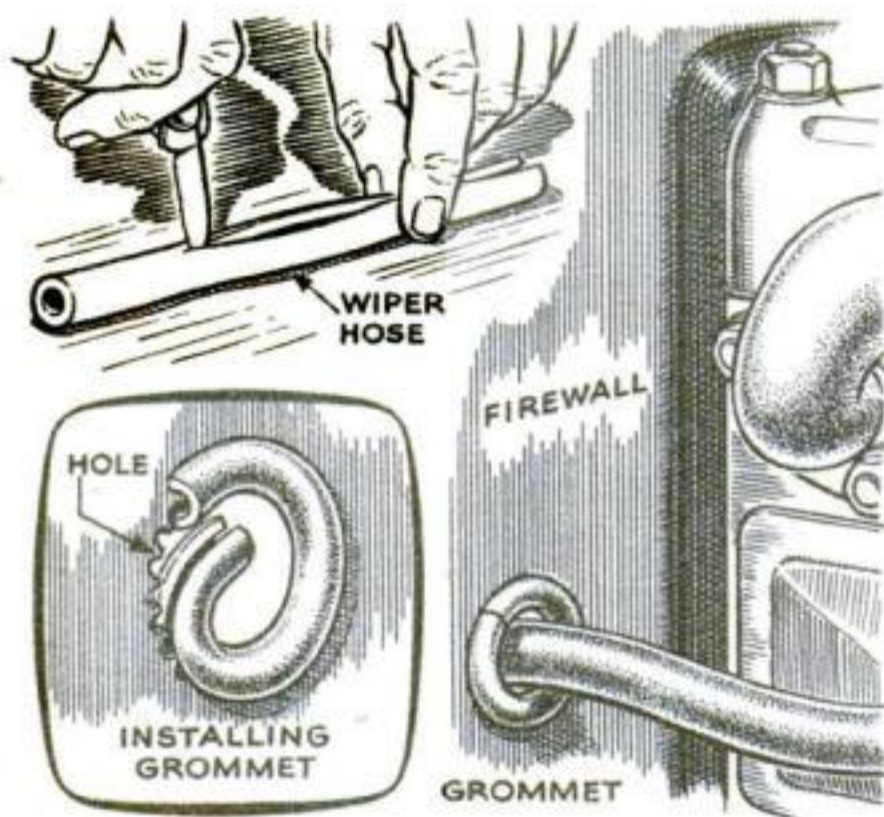


Speedometer Cable Fixes Horn.

A good way to replace defective horn wiring is reported by Lester L. Haberman, of Hartford, Conn. Instead of fishing wire through the steering column, he uses a broken piece of speedometer cable as a leader. A bent clip soldered to the end, small enough to pass through the hole in the column, hooks the horn wire to pull it through. A blob of solder on the tip will engage it securely.

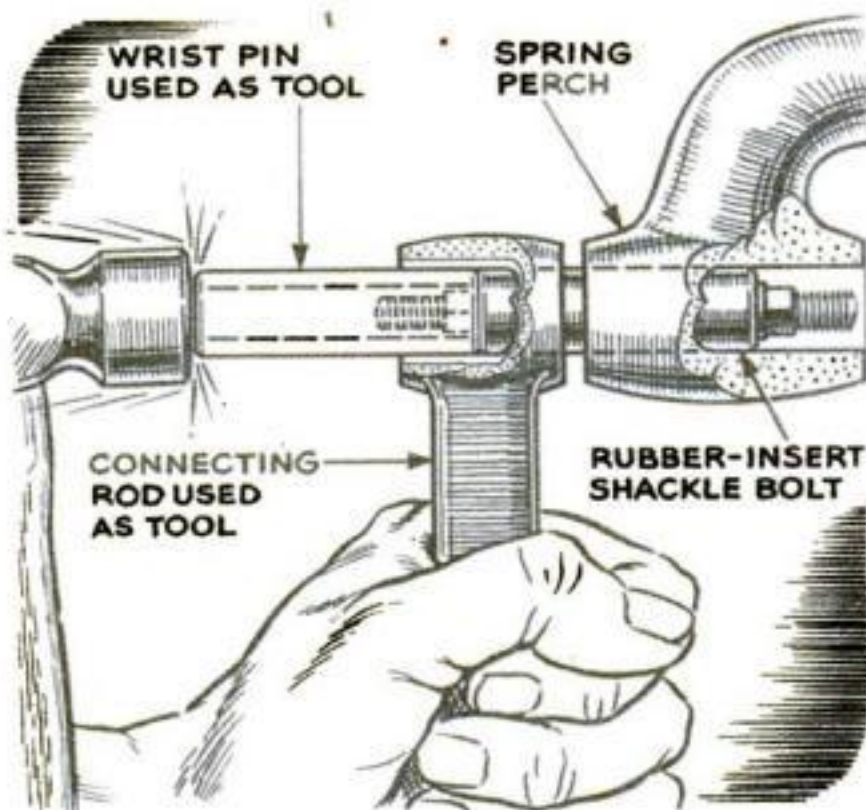


Bolts Pull Oil Retainer. The oil seal on the differential housing of one Plymouth seemed to be in for good, but Stanley T. Lusas, Woodbury, Conn., found a way out. Sawing a flat on two $3/8$ " carriage bolts, he was able to slip the altered boltheads into the groove from which the felt ring was removed. By alternately tightening nuts against a simple bar yoke, he drew out the seal. Different bolts may be needed on other cars.

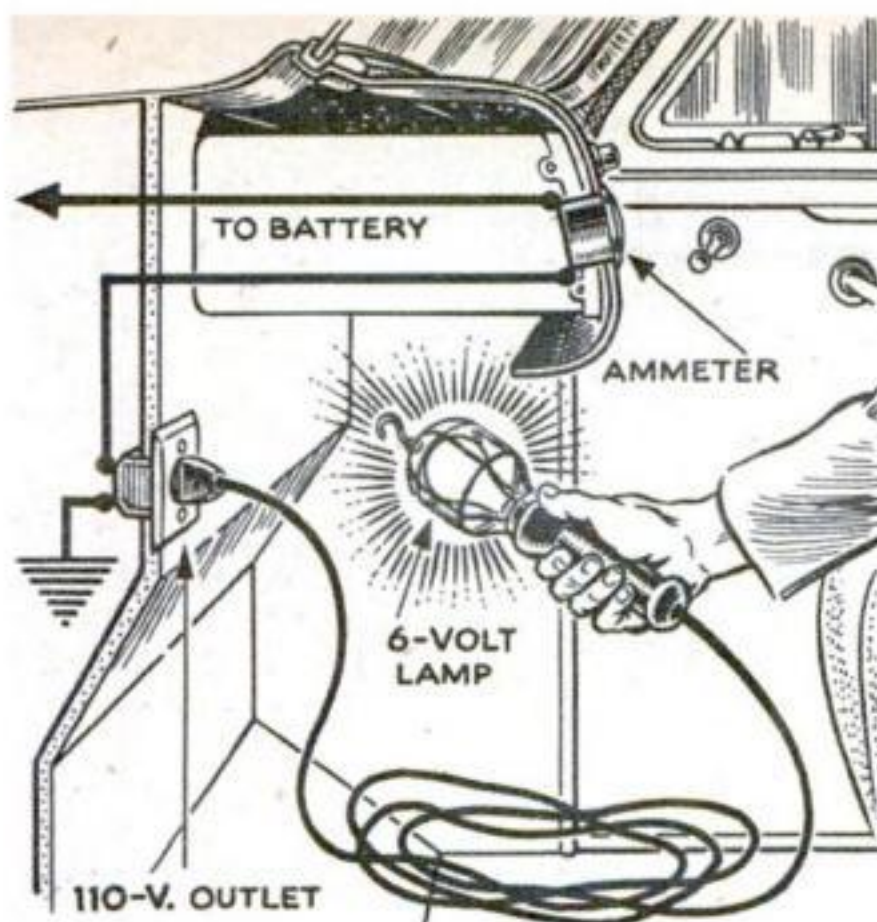


Grommet Guards Heater Hose.

In making a hole in the firewall for heater hose you may have to drill a circle of holes and chisel out between them. Protect the heater hose from the jagged edges by slitting a piece of windshield-wiper hose and cementing it around the rough inside edge.

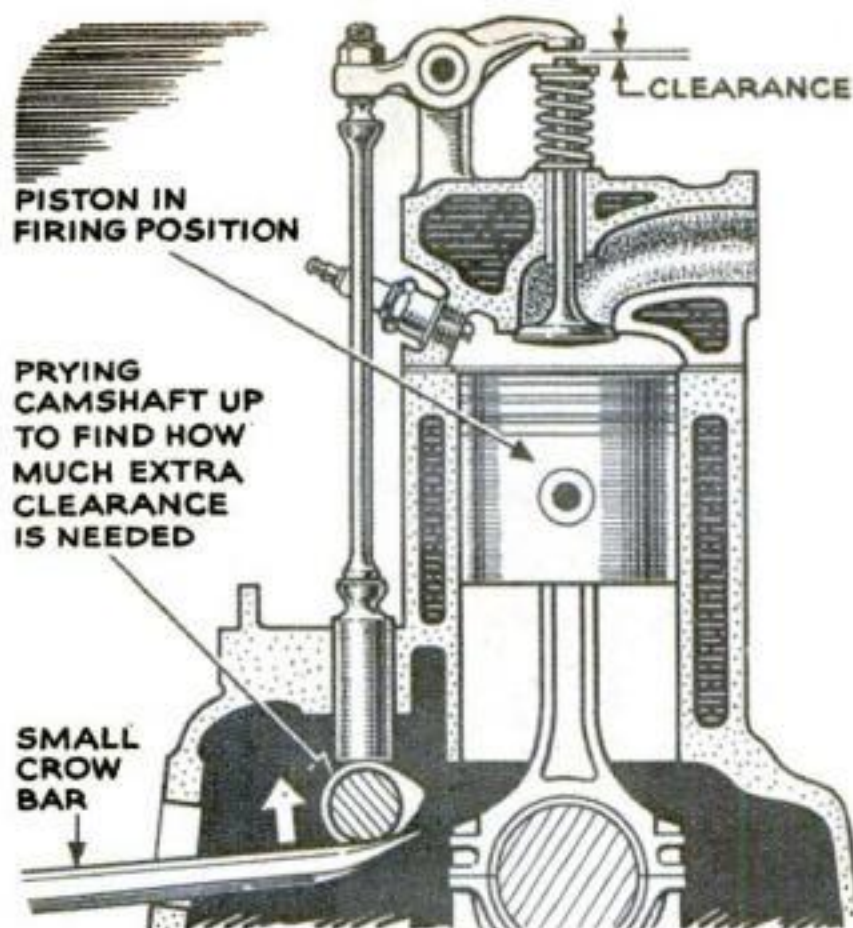


Wrist Pin Drives Shackle. When installing rubber-insert shackle bolts, George Pedley, of N. Grosvenordale, Conn., uses two other parts as tools. A wrist pin, annealed by heating, is employed for driving the bolt, and a connecting rod is used as a guide to keep the rubber from expanding.



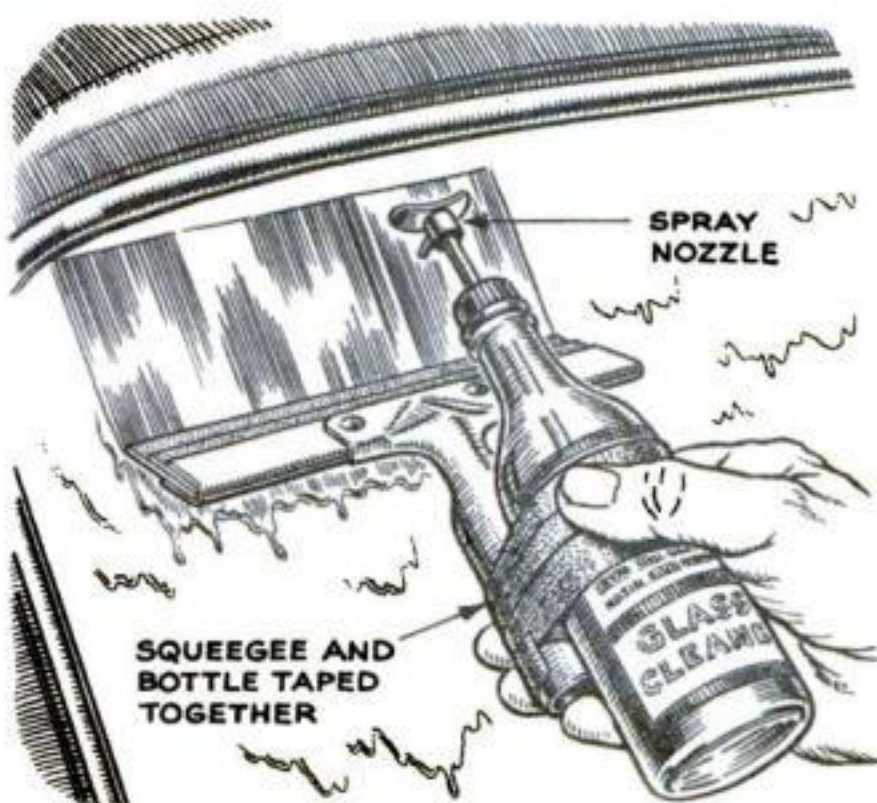
Trouble Light Doubles in Car.

One extension cord kept in the car is always available for use as a trouble light with the accessories added by W. M. Dierks, of Chicago. He installed a standard 110-volt outlet in the car, wiring it from the ammeter to ground. At the other end is a 6-volt bulb with a standard screw base. For use on house current it is only necessary to replace the bulb with a 110-volt one.



Wear Alters Clearance.

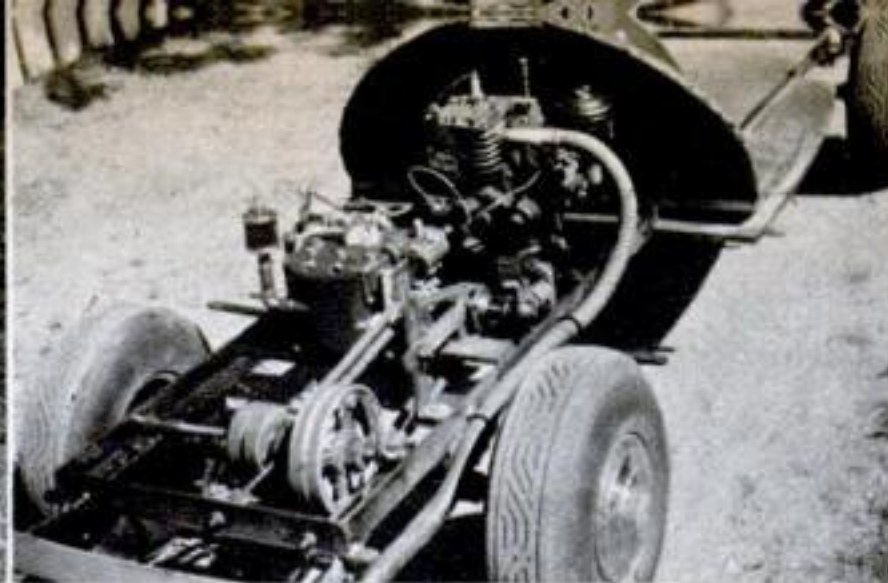
Worn camshaft bushings may cause burned valves by reducing the apparent tappet clearance. Caral Lee, of Weld, Me., suggests this test for Chevrolets: Set the No. 1 tappet, remove the fuel pump, pry up the camshaft, and recheck the clearance. Since the camshaft tends to ride at the top of its bushings during rotation, the measured difference should be added to the normal clearance.



Unit Windshield Cleaner. Tape a rubber squeegee to a bottle of glass-cleaning fluid fitted with a spray nozzle, writes Sally Mills, of Syracuse, N. Y. When the windshield needs cleaning you only have to dig out the one unit to spray the fluid and wipe it off immediately.



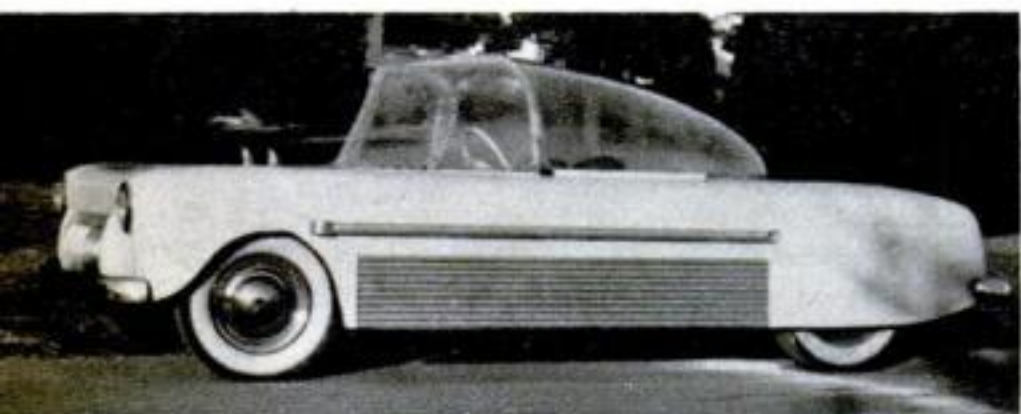
Stool Built of Brake Drums. One mechanic made his job easier by welding two discarded brake drums together. Four casters on the bottom and a sheepskin buffing pad on top make it a serviceable rolling stool. It's particularly good for jobs for which you'd ordinarily have to kneel.



Surplus Parts Made into Streamlined Midget Car

THE State of Michigan collects \$4 a year license fee from Dale and Dick Kitchen, above, which should be sufficient proof that the speed wagon they are riding in is no toy. Built for them by their father, Jae D. Kitchen, of Caro, this car can do about 12 m.p.h. A 1½-hp. gasoline engine supplies the power; it is joined by a flexible coupling to a hydraulic transmission of the type used for turret control on bombers. The transmission operates in either direction, and automati-

cally returns to neutral. In this position it has a locking action that serves the car for brakes. An airplane gas tank was split in two to make the streamlined body. A grille is welded in front. The uncovered rear view at the right above shows the motor and transmission and the double V belts that go from the transmission to a jack shaft and then to the axle shaft. The left rear wheel is the powered one. Approximate cost for all parts, including the motor, was \$350.



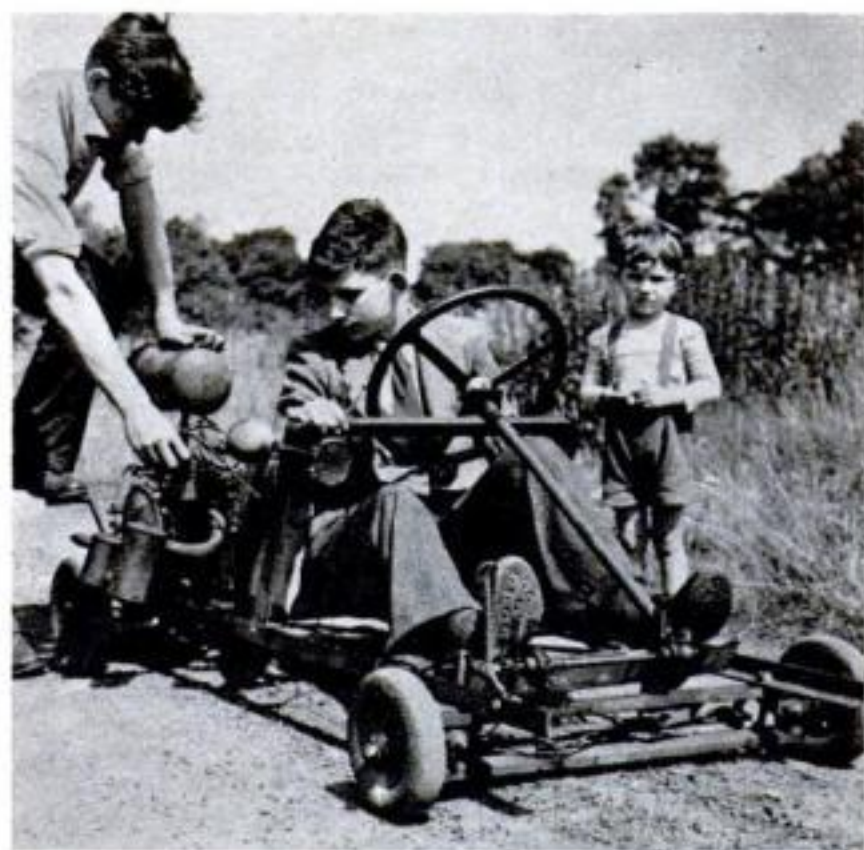
Plastic Dome Tops Hybrid Auto

A MIXED assortment of old automobile and aircraft components went into this home-made car built by Ray Sears and his son Vernon, of Tulsa, Okla. It took them about six months of spare-time work to complete this answer to the new-car shortage. Auto parts ranging from Ford to Cadillac are represented. A Ford V-8 engine with dual carburetion and other modifications was used. The builders estimate 100 m.p.h. top speed.



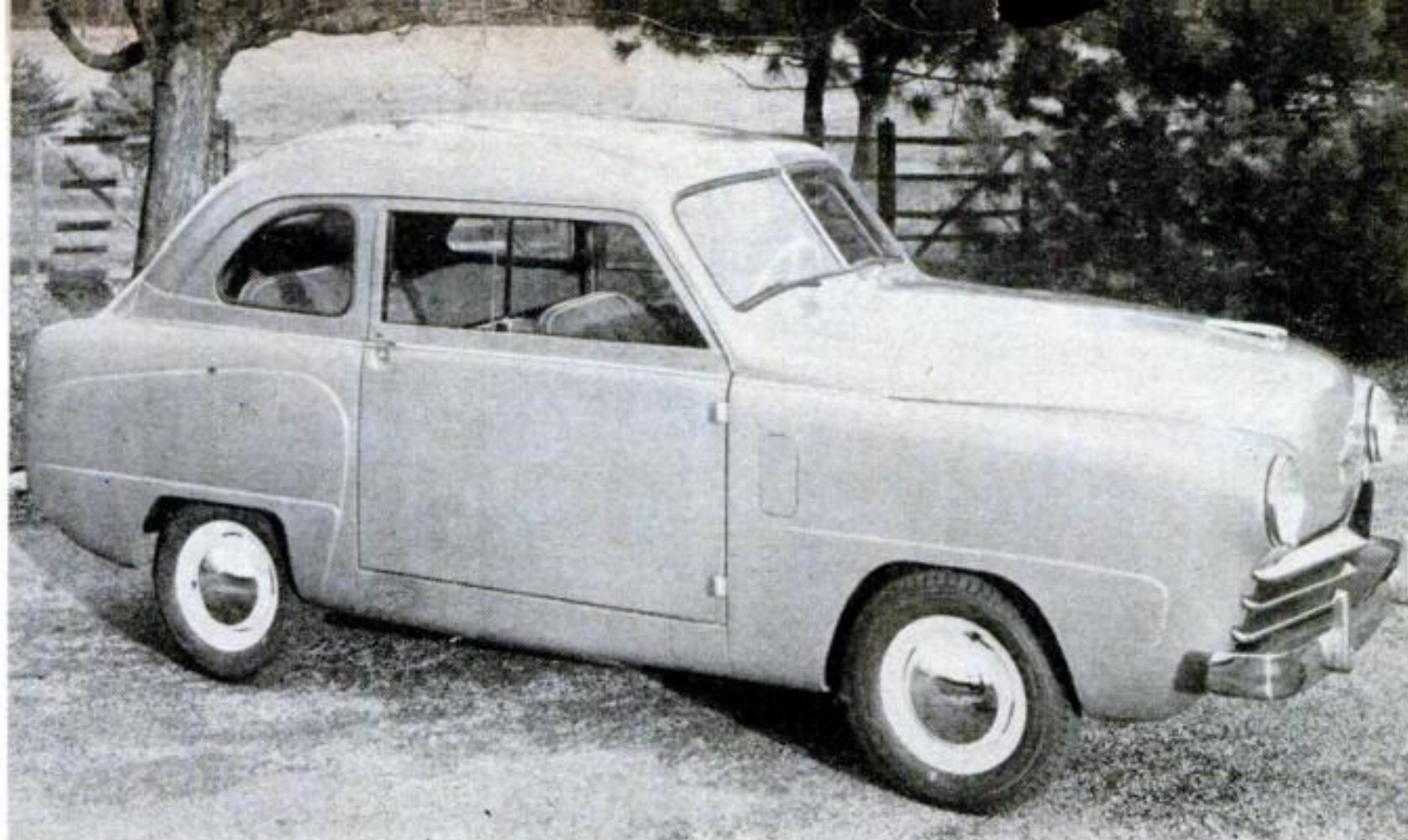
Side Mirror Has Fingertip Control

INSIDE adjustment for outside mirrors is provided by Saf-T-View® side mirrors, made by Trout & Lewis, Glendale, Calif. The lever plane marked A is for horizontal movement; B is for vertical. Together they eliminate most blind spots.



Car Built Entirely of Scrap

AIDED by two youthful friends, 16-year-old Brian Lloyd-Jacob, of Banstead, Surrey, England, built this odd-looking but useful vehicle entirely from cast-off parts. Cash outlay totaled only 12s. 6d. (about \$2.50). Economical in operation as well as construction, the car gives about 65 miles a gallon and has a road speed comparable with that of much larger cars. Parts from scrap heaps and junk yards make up the bulk of the materials. Peter Billing and Geoffrey Fletcher helped in rounding up and assembling the components. Photo shows Brian working the kick starter. Geoffrey is at the wheel.



Extension of fender lines and fender-housing of headlights give sedan graceful appearance.

Little Crosley Looks Bigger

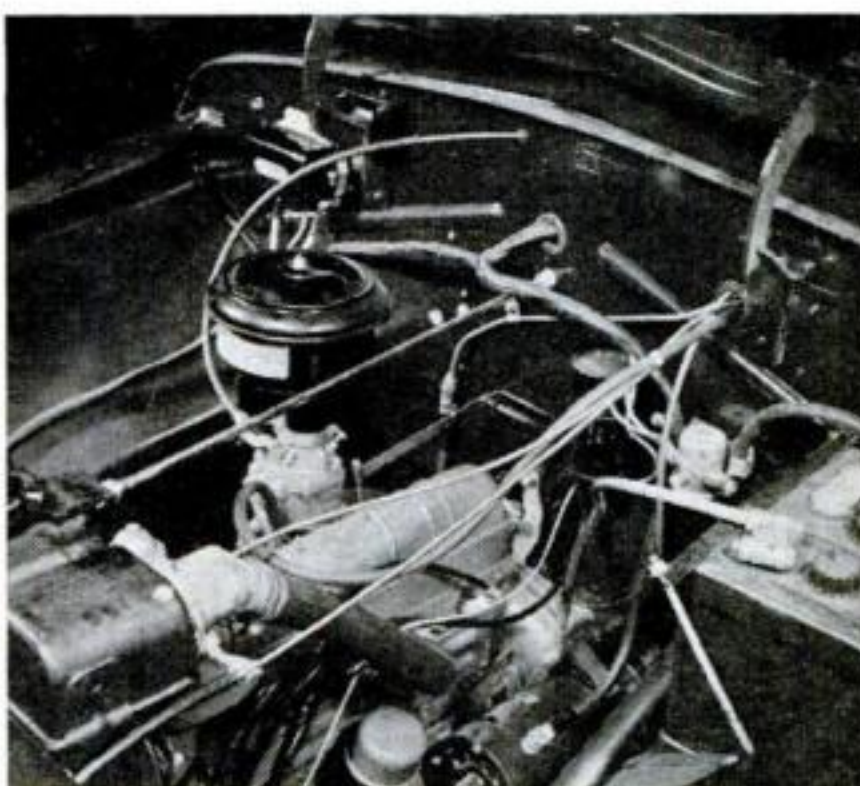
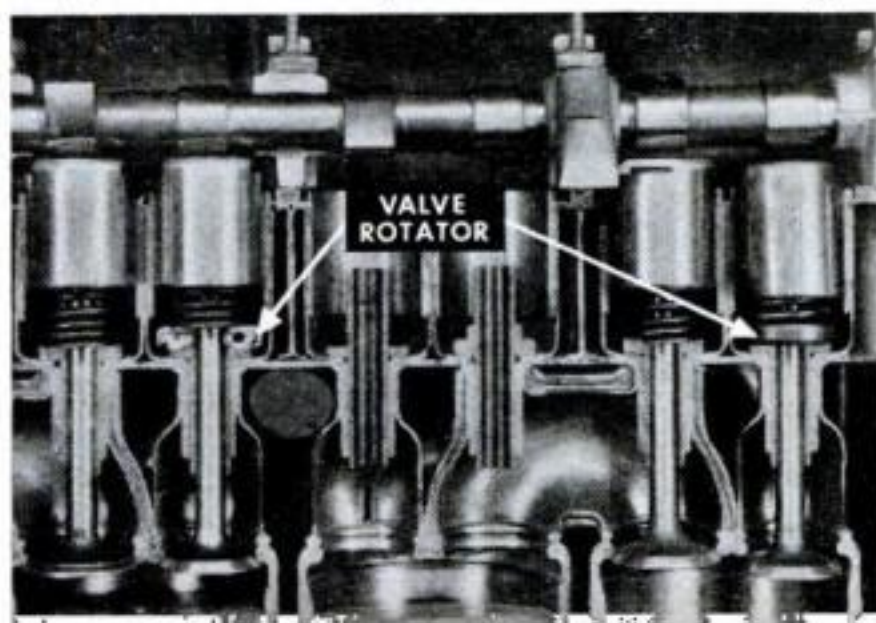
AMERICA'S smallest car has taken some hints from its big brothers. The Crosley, recently restyled to look larger, now also has such big-car features as sealed-reflector headlights, blinker directional signals, and two windshield wipers instead of one.

Nor is this all. Compression of the four-cylinder, valve-in-head 26.5-hp. engine has been raised to 7.8-to-1. Company engineers say this adds about 5 miles per gallon to the gasoline range. With 7.5-to-1 compression, this was 35 to 50 miles per gallon.

Rotators have been added to the exhaust valves. These cause the valves to turn a fraction of an inch each time they open, allowing bits of carbon and other combustion products to pass into the manifold. This reduces wear and pitting of the valve.

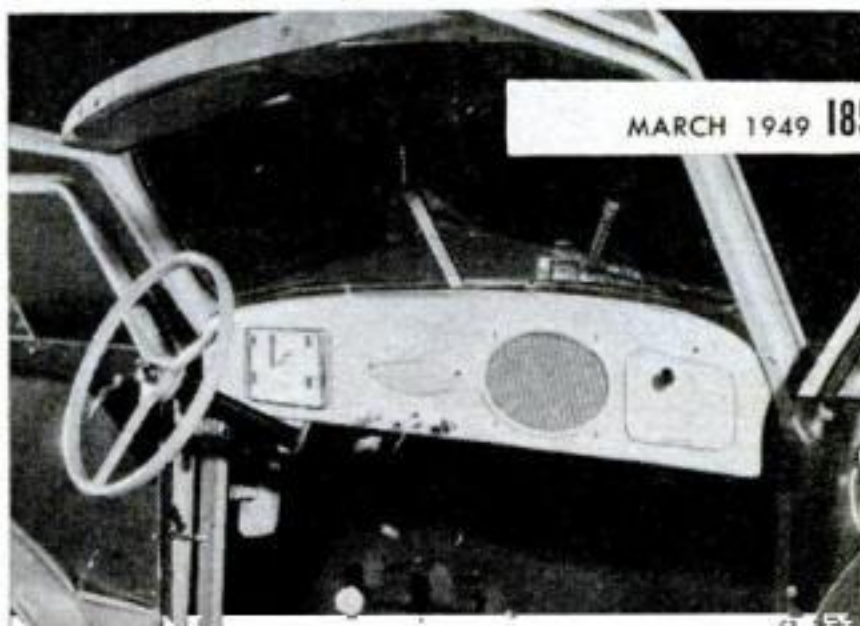
Four-ring pistons with the top ring chromium plated reduce oil consumption.

New rotators are claimed to lengthen exhaust valve life three to ten times. Shown here in a full (right) and sectional view, these were adapted from Thompson Products' Roto-Cap®.



Compression has been upped to 7.8-to-1. Other engine improvements include a larger starting motor and generator, a voltage regulator, an oil-bath air filter, and a ball-bearing fan.

Dash instruments are now all grouped in one rectangular panel just ahead of driver. More luggage space is available in all models. It's reached by pulling forward hinged rear seat.



MARCH 1949 185

Sports-Car Fans Ride Four-Wheeled Hobby

Some of their small, foreign-made cars are a dozen years old, but they still look like a million bucks.

By R. P. Stevenson

PS Photos by W. W. Morris

SPEAK of sports cars, and most Americans will think of snappy convertibles from Detroit. These, it is true, are *sporty*, and certainly fine cars. But the sports-car devotee will tell you that they're far from what he's talking about.

Typically, a sports car is foreign. There is none made in the U. S. Two structural differences distinguish it from the family passenger car—its chassis and its engine.

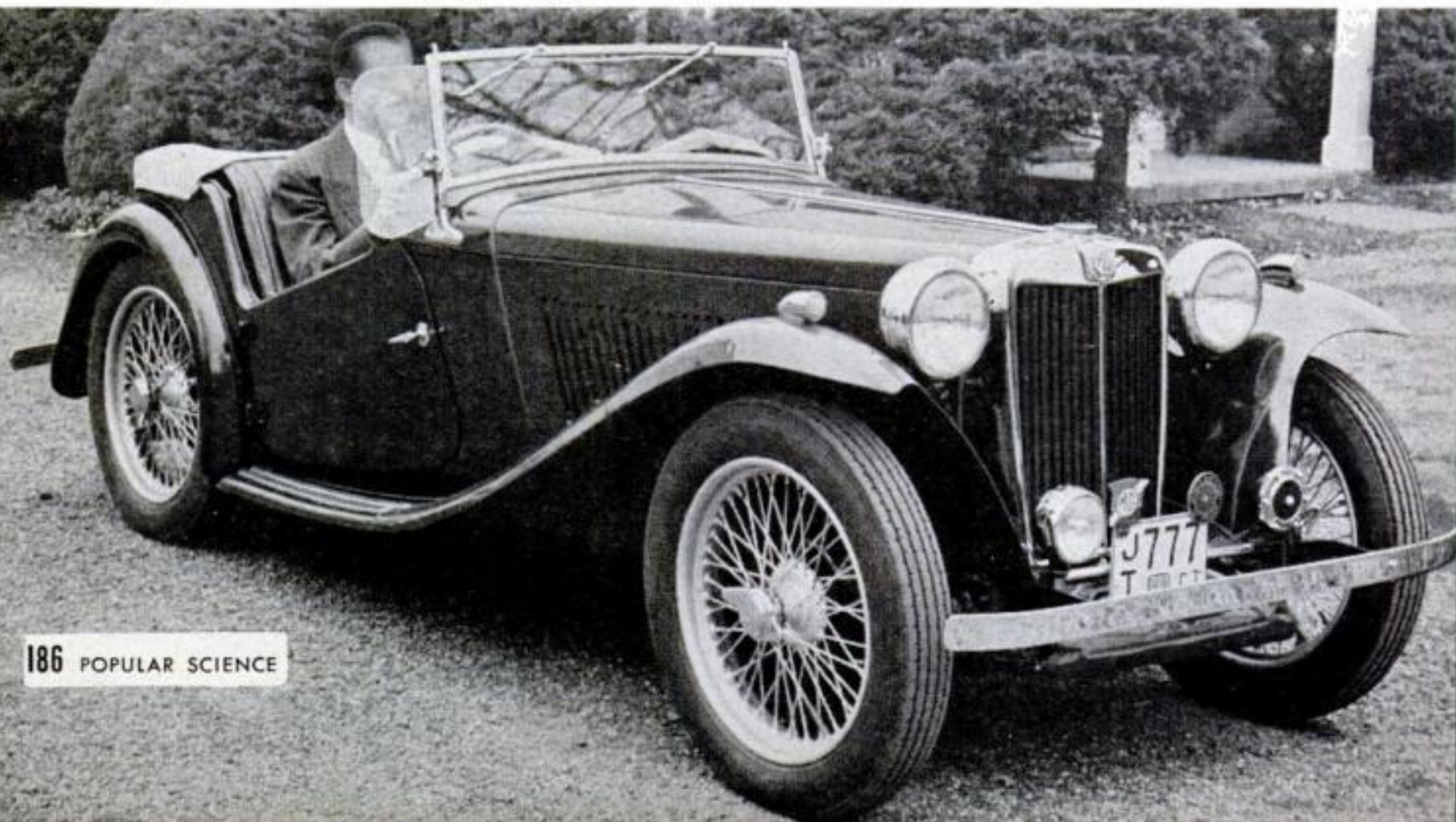
Although small, the engine usually develops more horsepower per cubic inch of piston displacement than anything you've been accustomed to driving. The new high-com-

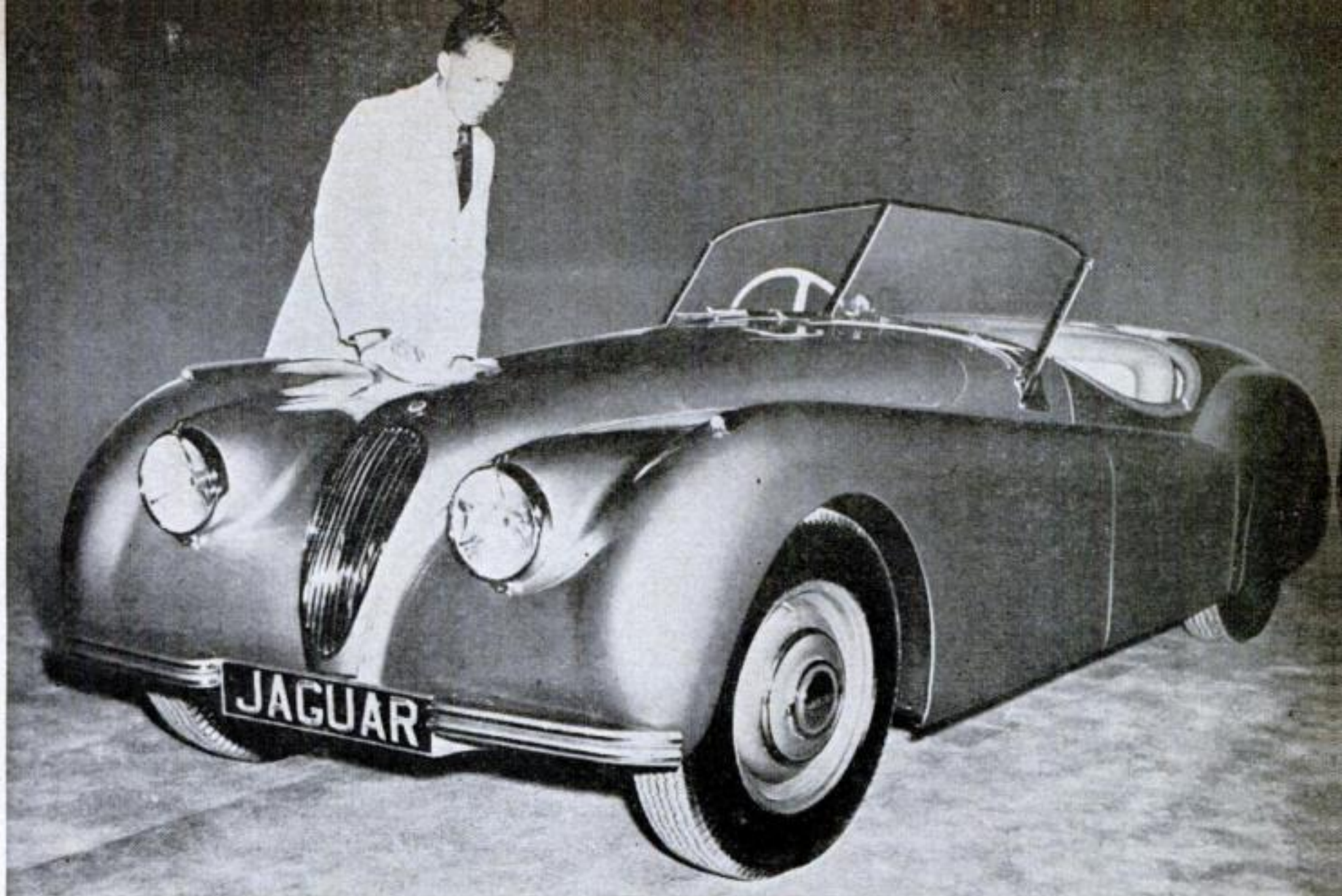
pression Cadillac engine, for instance, develops only 160 hp. for 331 cu. in.—less than $\frac{1}{2}$ hp. per cu. in. Sports-car engines often give as much as $\frac{3}{4}$ hp. or more per cu. in.

A sports car is low-slung, and usually has a short wheelbase. Body types vary, though they're mostly open two-seaters. Four-speed transmissions are the rule. Performance is excellent, especially in road-keeping and "cornering" qualities. They'll stay on curves at speeds that would send the family sedan blooping into the guard rail. Springing is hard, uncomfortable in fact, and after a ride you may wonder that anyone would want a sports car.

Their appeal is basically to the art of driving—to the stimulus of skillfully controlling a high-performance mechanism. Take the case of the new two-seater Jaguar, sensation of the recent London auto show. The manufacturer plans to turn out some 2,000 of these in the next year. Within a few weeks

M.G. Midget is one of most popular sports cars, both here and abroad. This is a '48 model.





New Jaguar. This streamlined honey has aroused lots of enthusiasm among U. S. sports-car fans. Two models are available. They're identical except for the engines. One has a 210-cu. in.,

6-cyl. engine that develops 160 hp. at 5,000 r.p.m. Top speed is 120 m.p.h. The other has a 121-cu. in., 4-cyl. engine, developing 95 hp. for a top speed of 100. Price: under \$5,000.

after the first announcement, orders for 1,600 had poured in from the U. S. alone.

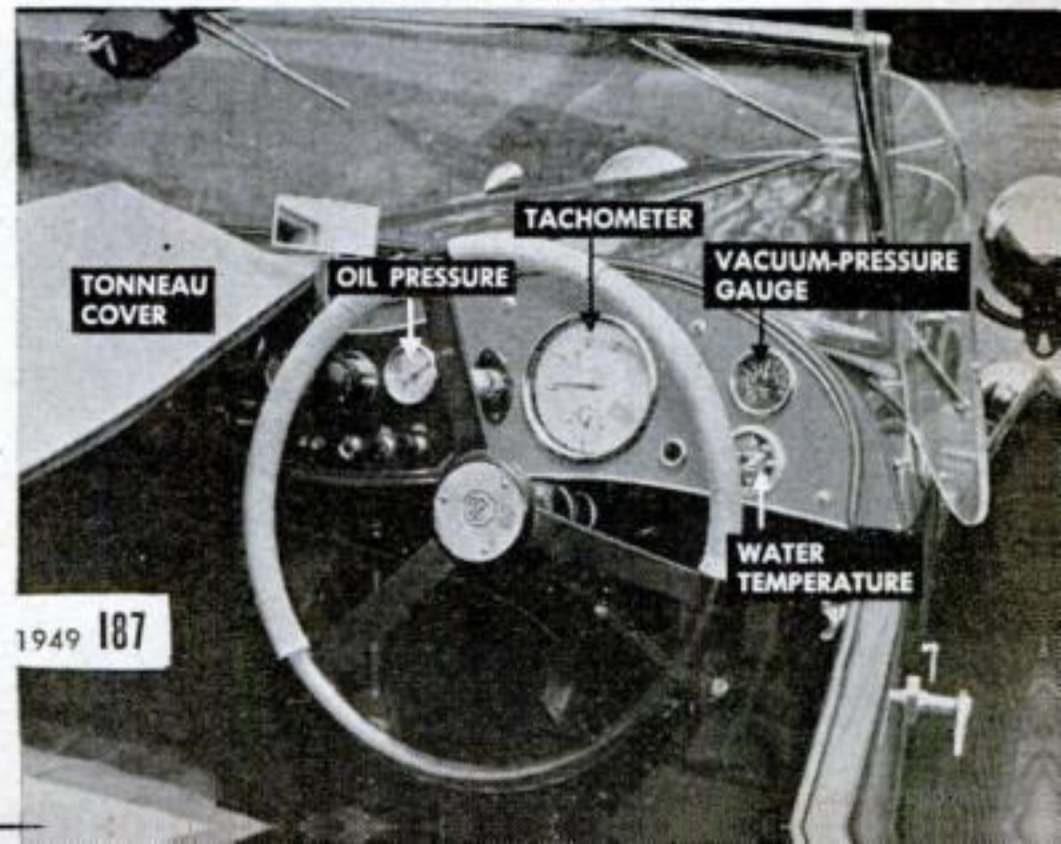
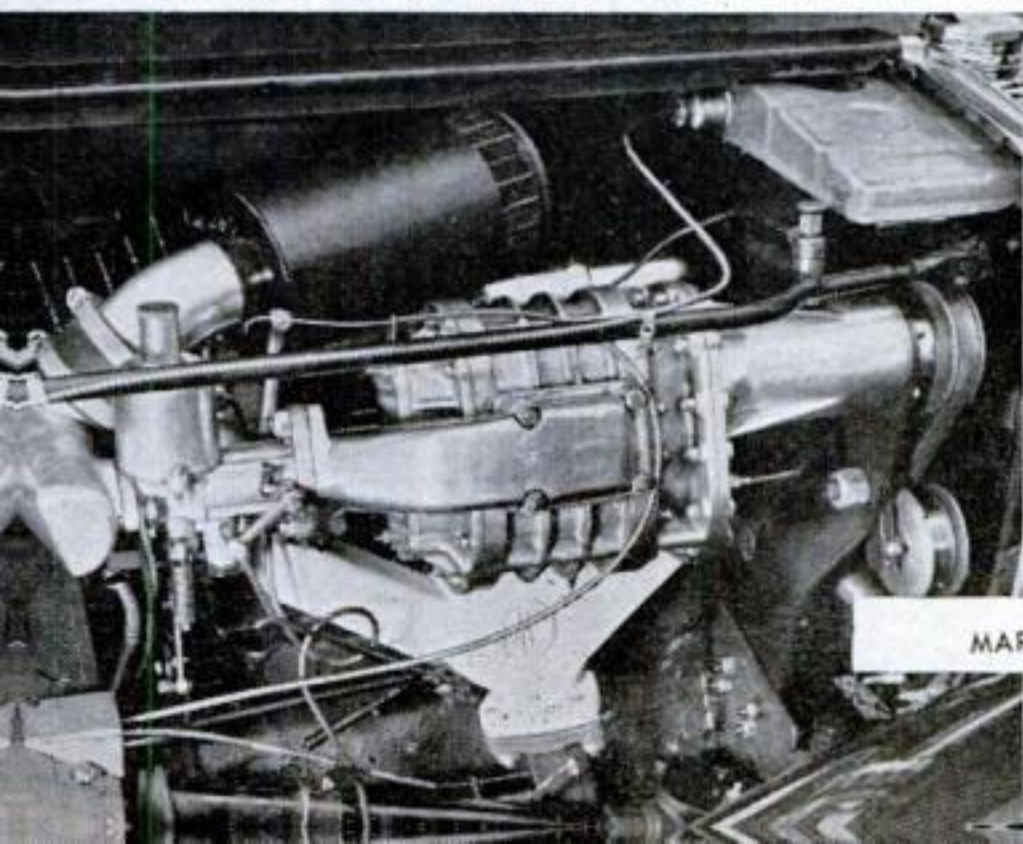
Rated one of the hottest sports cars, this Jaguar is powered by an entirely new engine—with twin overhead camshafts, hemispherical combustion chambers, and 7-to-1 compression. The car will sell in the U. S. for less than \$5,000.

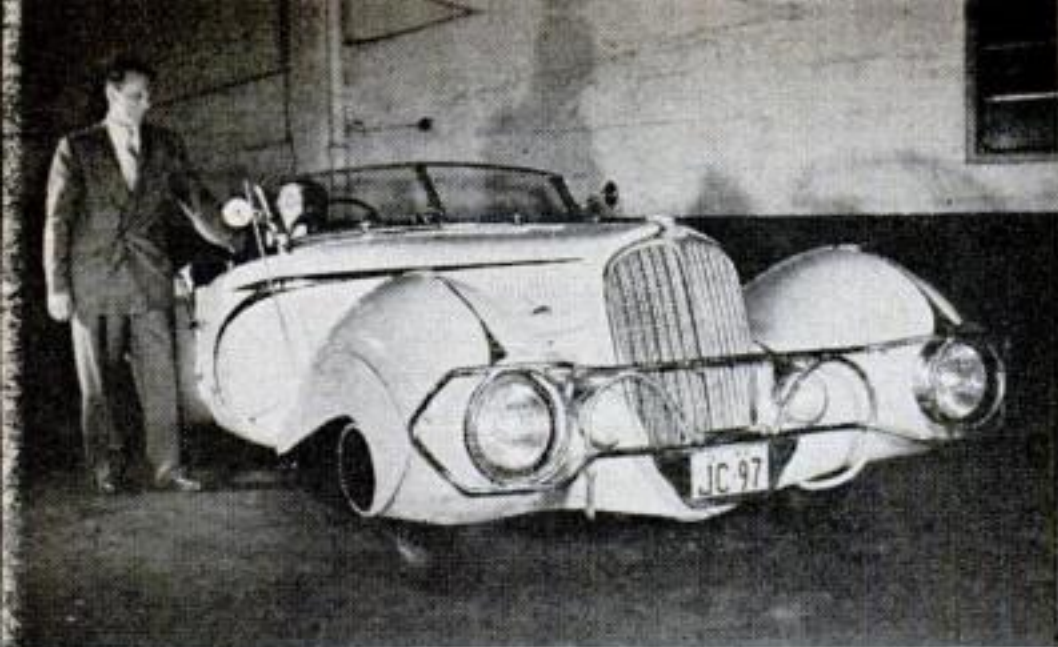
A sports car lies somewhere between the conventional American family car and the high-speed machines that burn up the track at Indianapolis. At times, it may serve just for transportation. But not often. Its main purpose is to give the owner a lot of fun and sport. Developments that eventually find their way to passenger vehicles fre-

British-made, the M.G. costs about \$2,400 in the U. S. Below are some features you get.

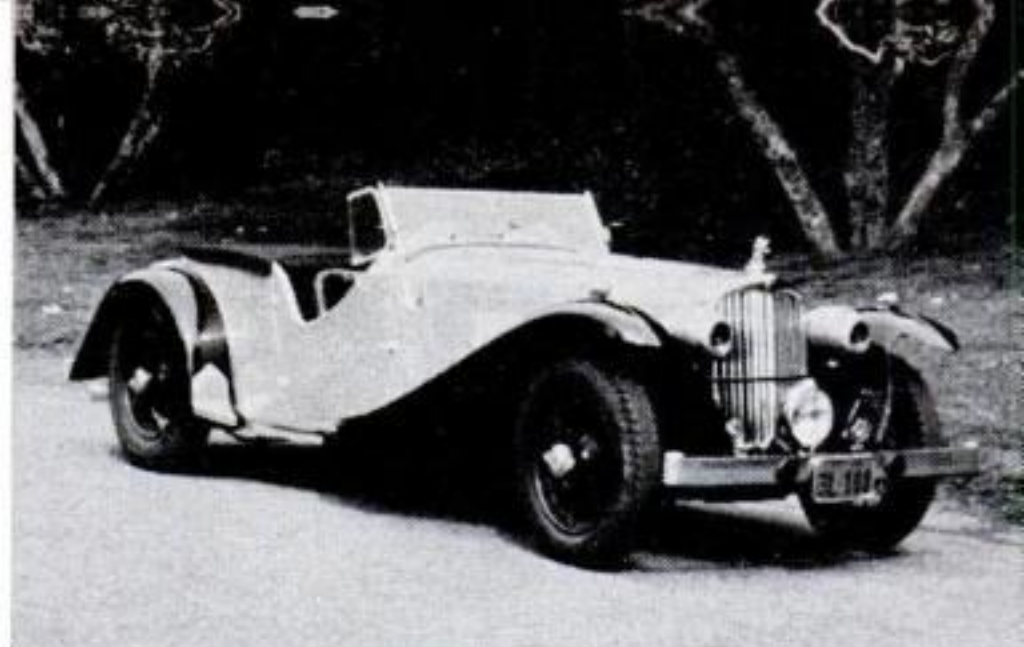
A supercharger gives added power. Notice the air intake just under the hood and the blower housing at center. The 4-cyl., 76.25 cu. in. engine has overhead valves, pushrod operated. The M.G. shown was fast enough to place third in road race at Watkins Glen, N. Y., last fall.

Watch the tachometer—rather than the speedometer. That's usually a rule with sports-car drivers. The idea is to manage the throttle and shift lever so the engine turns at its most efficient speed. In this supercharged M.G. this speed is somewhere around 5,200 r.p.m.





Delahaye. Although this snappy car is a dozen years old, you might think it presents a style for the future. It was one of six fitted with this Figoni & Falaschi body in 1937. The owner designed the bumpers. Its triple-carburetor, 183-cu. in. engine develops 130 hp.



The AC. An all-aluminum body on this 1939 British car gleams like polished chrome. Powered by a 80-hp., 6-cyl. engine, it quickly gets up to 90 m.p.h. It's owned by David Mitchell of Brooklyn, N. Y. Among enthusiasts, an AC often is ranked as the Rolls Royce of sports cars.

quently are given their first tests on sports cars.

The American demand for this type of car has gone into two channels. On the one hand, you have the hot-rod fans, the lads who take a conventional American car, strip it down, shave off the head, and personally perform a few other tricks to hop it up. When they're finished the result bears little resemblance to the original car.

On the other hand, you have the enthusiasts who own and drive foreign sports cars. These are standard products of the factory

from which they came. Owners usually make few changes.

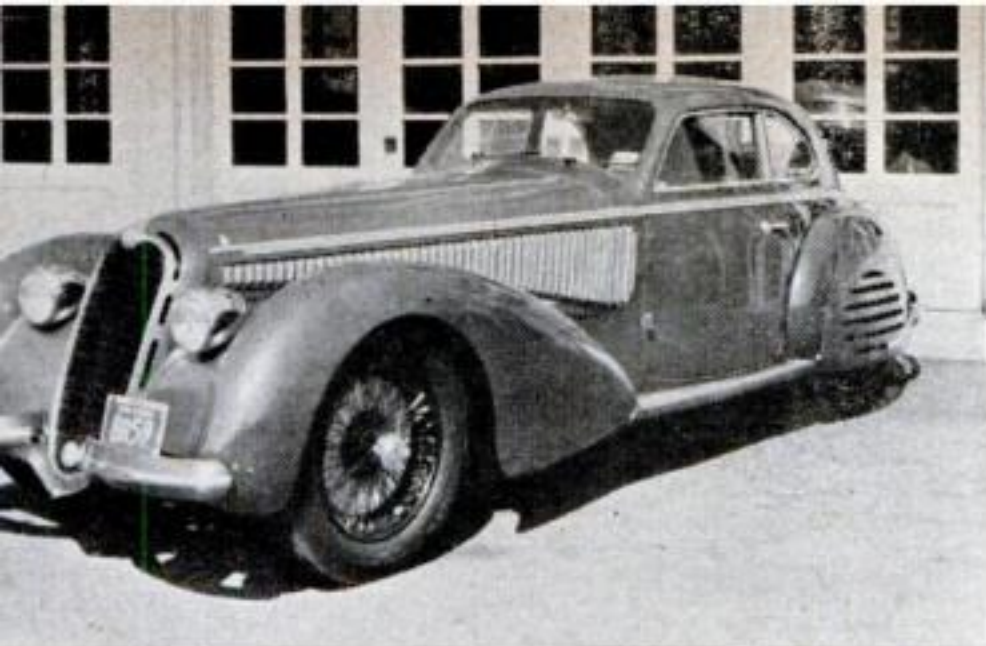
Considering the prices asked now, it may seem surprising that there are so many sports cars in the U. S. Look a little closer, however, and you'll see that a good many are a dozen or more years old, probably picked up secondhand. But age makes little difference. Kept in peak condition, they still perform well—and in their new paint, polished metal, and bright upholstery they look like a million bucks.

Sports-car fanciers here are organized in

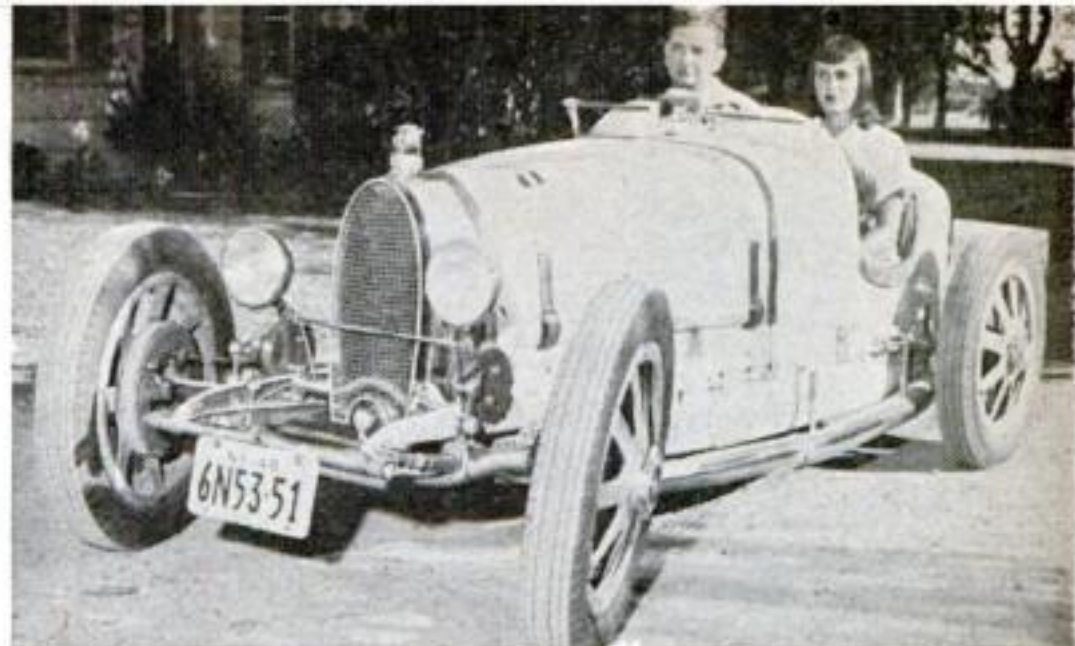
Low-slung B.M.W. of this type was 1940 winner of the Mille Miglia, 1,000-mile race in Italy on ordinary roads. In this race, it *averaged* 104 m.p.h. at a gas consumption of 26 m.p.g. The

present owner has had it up to 108 m.p.h. on an American highway. Bumpers were added in this country. They're quickly removable by loosening two bolts. At the right—the engine.





Alfa Romeo. F. T. Griswold, Jr., Wayne, Pa., won road race at Watkins Glen, N. Y., in this 1939 model last fall. The 177-cu. in. engine has twin superchargers, develops 180 hp., and has a top speed of 125 m.p.h. Compression is 5.75-to-1. Body is a touring "Superleggera."



Bugatti. Cartoonist Charles S. Addams owns and drives this type 35 Bugatti. It's powered by a 2-liter (122 cu. in.), straight-8 engine with a single overhead camshaft. Each cylinder has three valves—one exhaust and two intake ones, for better "inhalation."

two major clubs—the Sports Car Club of America and the Motor Sports Club of America. Both groups conduct frequent weekend field events. These include hill climbs, acceleration trials, average speed runs, obstacle races, and scratch races. Sometimes there are also informal get-togethers where the talk runs mostly to superchargers, revolutions per minute, and questions like "where can I get that spare part?"

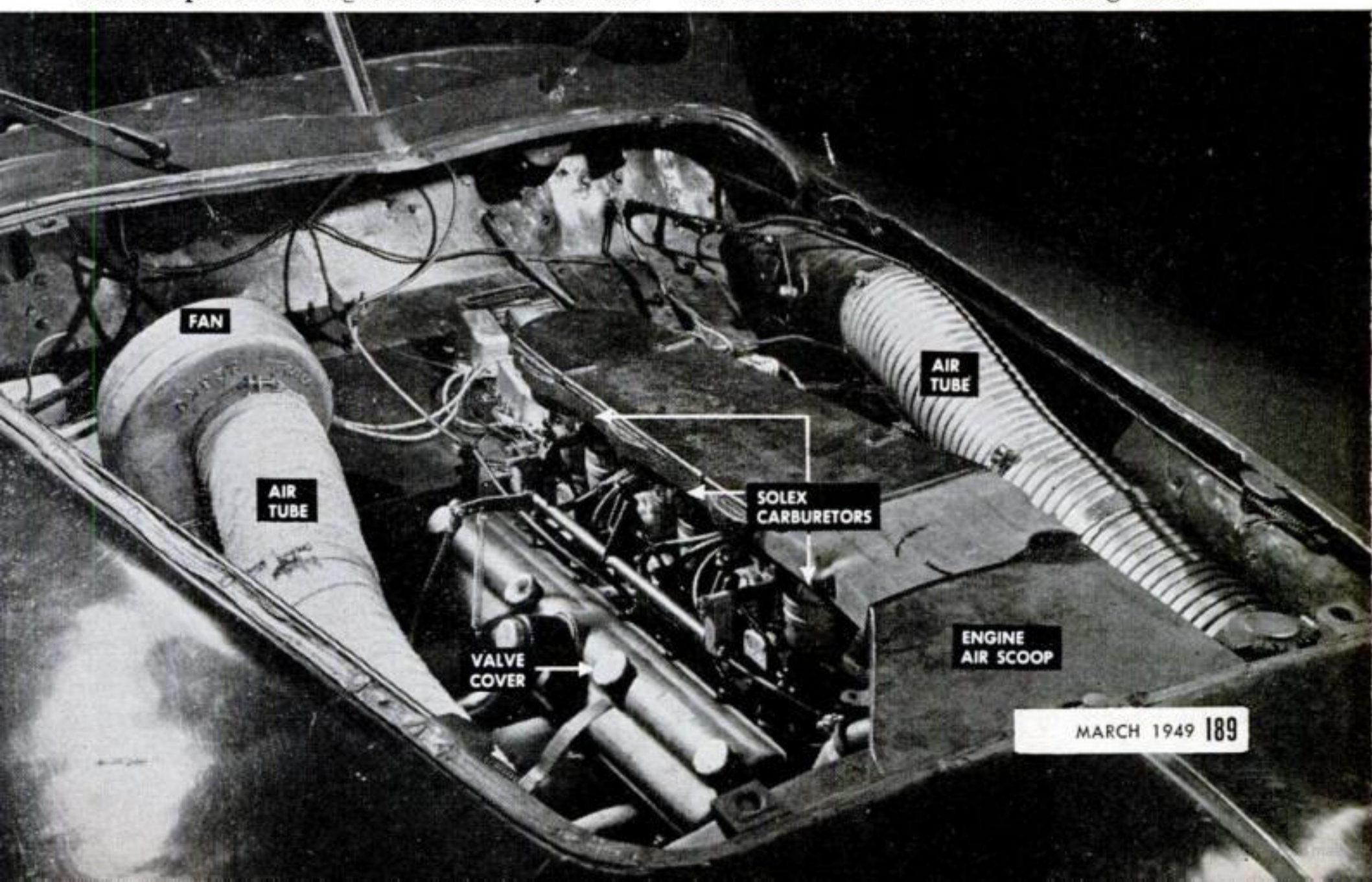
Last fall, the Sports Car Club sponsored a road race, top event in all sports-car activity. Conducted on a winding 6.6-mile circuit at

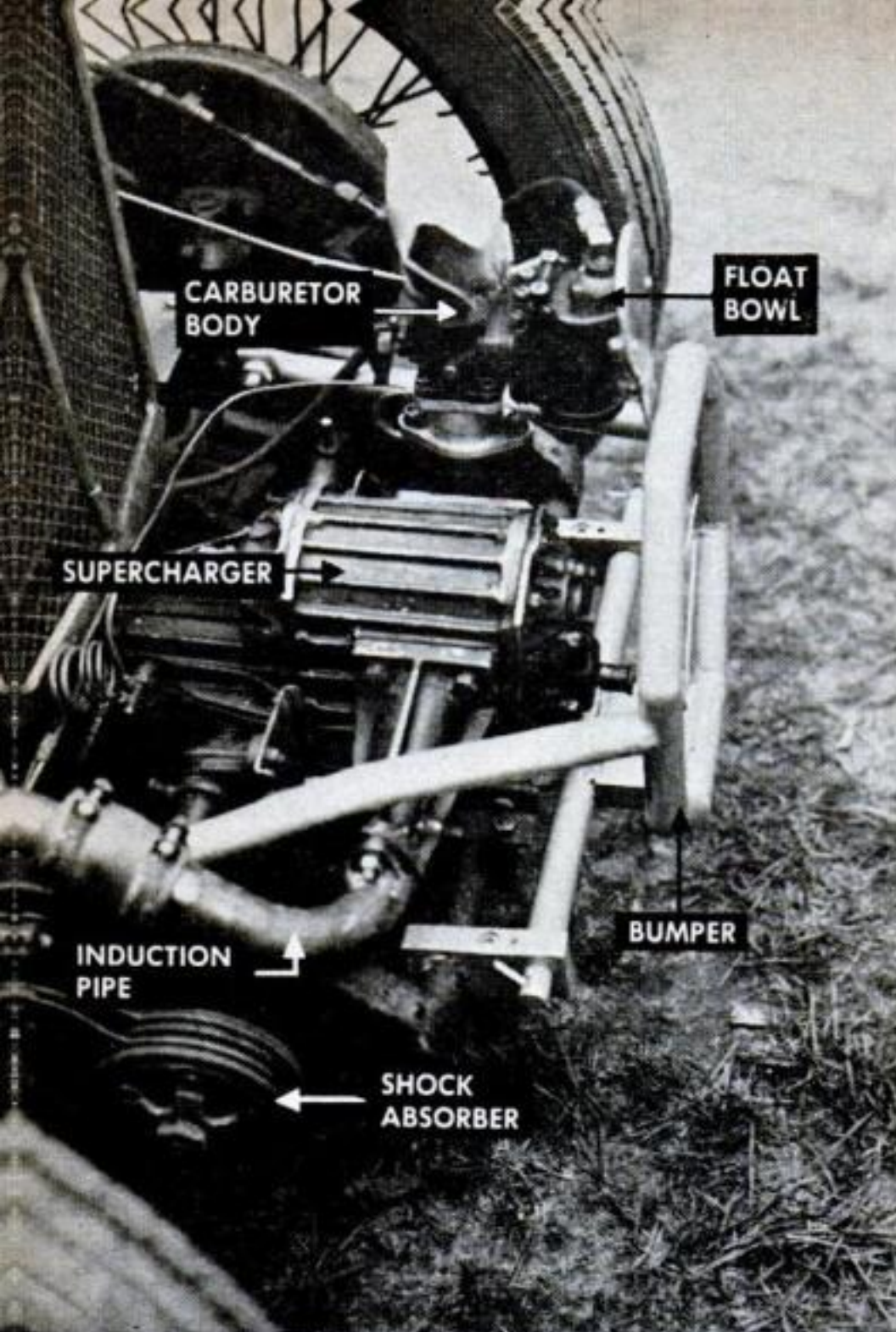
Watkins Glen, N. Y., this meet was the opening move in an attempt to revive road racing in the U. S. This sport thrived here early in the century and still arouses national interest in European countries.

Most sports-car enthusiasts got the habit as kids. They're hobbyists from the toes up. Over the years they've probably owned and traded several cars. A few of the better-fixed keep a full stable of cars. The greater number, however, are one-car men. This they give the constant and loving care that's due a high-performance machine. ➤

Power to spare! The pushrod engine of this B.M.W. has a displacement of 122 cu. in. and develops 140 hp.—well over 1 hp. per cu. in. Put this power in a light chassis and you have

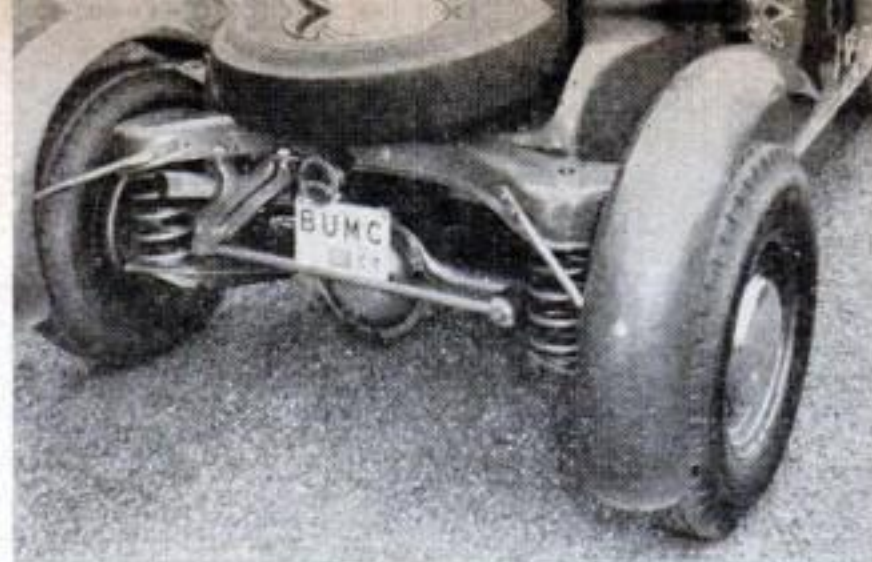
lots of speed. The total weight is 1,650 lb., an aluminum body accounting for only 95 lb. Because driver's compartment gets so hot, fan was added to one of two ventilating tubes.



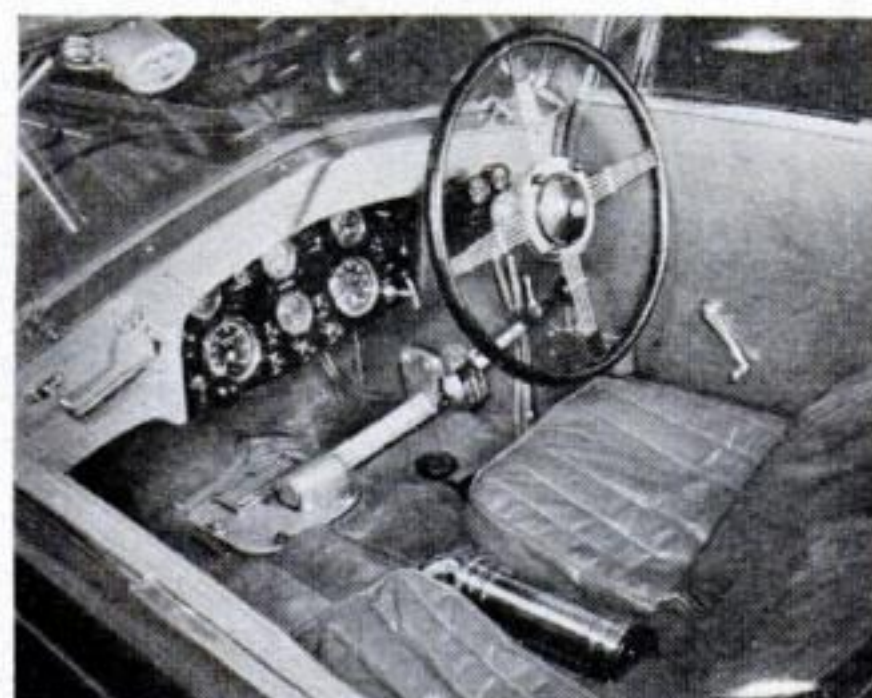


Supercharger installed on 15-year-old M.G. by I. O. Linton, Philadelphia, raised engine's top r.p.m. from 5,500 to 8,000. Blower is driven from forward end of crankshaft. Two electric pumps supply the fuel (gasoline-benzol) to the float bowl. Air enters through carburetor body.

In the early days, American makers produced a number of fine sports cars, among them this 1912 Mercer Raceabout. Restored to original

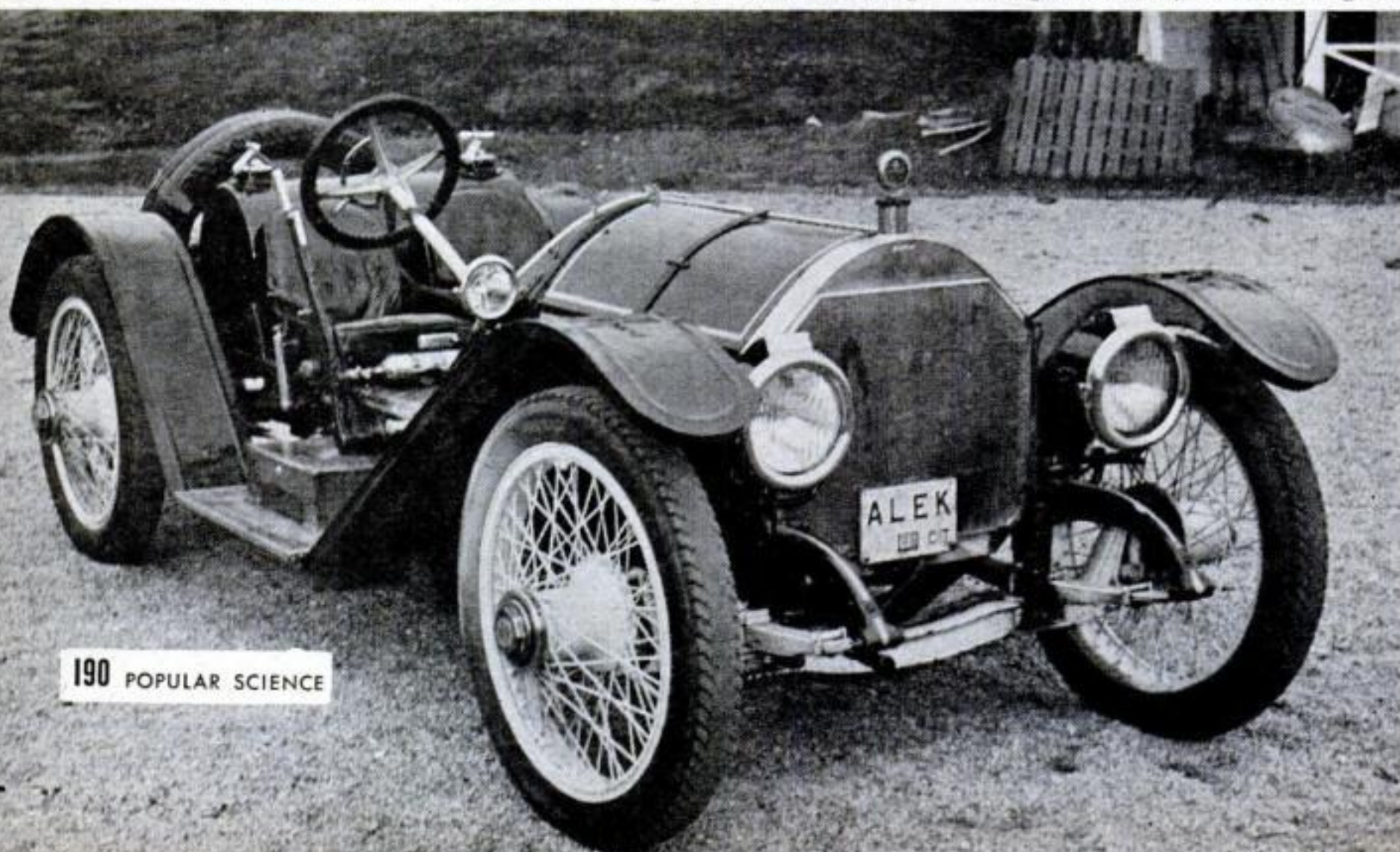


American cars sometimes are revamped to substitute as the sports type. Registered as a Bu-Merc, this bobtailed hybrid consists of a 1939 Buick chassis and engine with a Mercedes body. Engine was moved back 6½", lowered 2½". Special head gives it 9½-to-1 compression.



Invicta 100 owned by Ralph Stein, of Roslyn, N. Y., has knurled knobs on floor under wheel to adjust shocks, two dials ahead of driver showing how they're set. Big knob at left end of panel works hand gas pump. The car also has twin electric pumps. This is a 1935 model.

condition by Alec Ulmann, Old Greenwich, Conn., it still is capable of a lot of speed—more than 80 m.p.h. It's powered by T-head engine.



REG. U. S. PAT. OFF.

PAGE 214

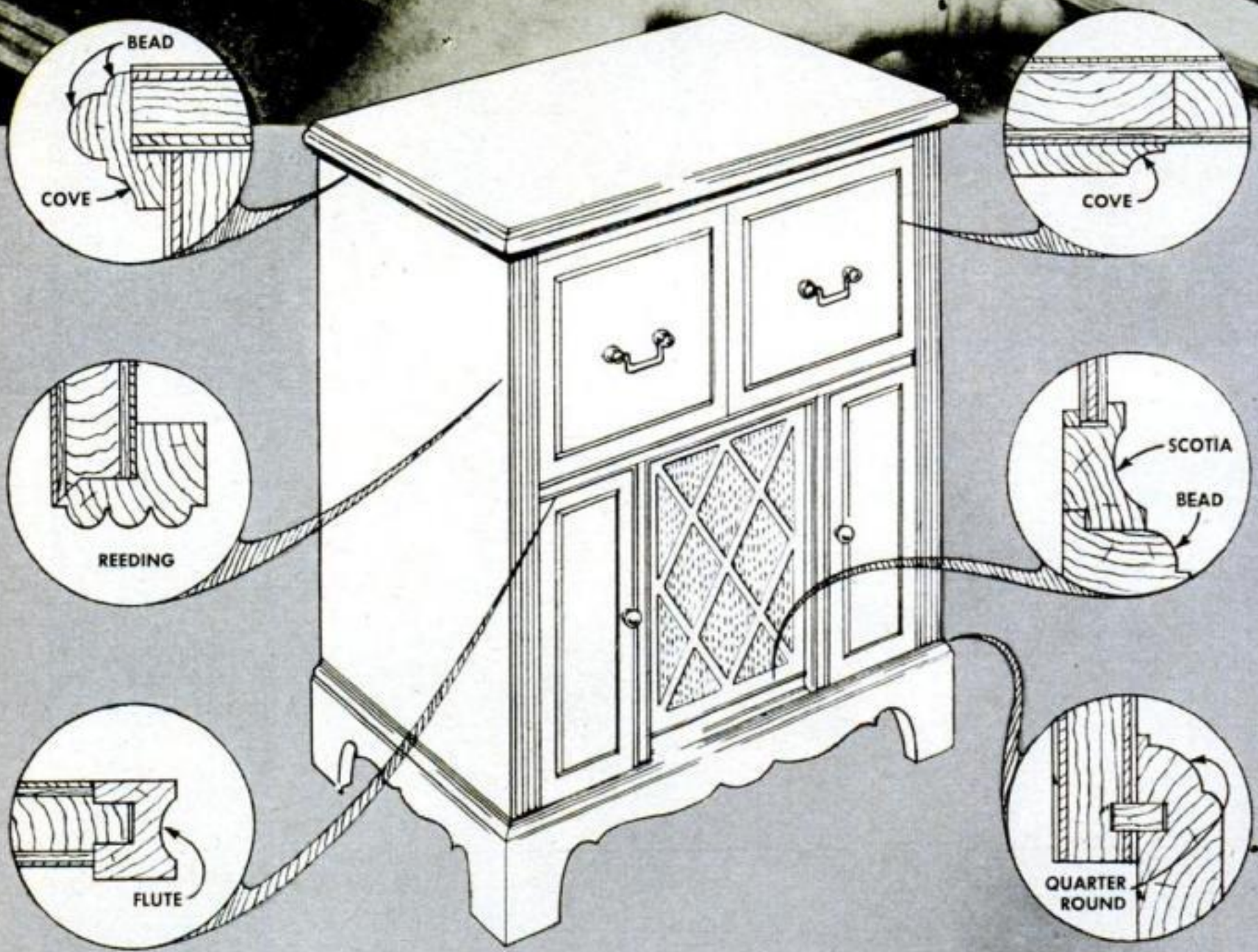
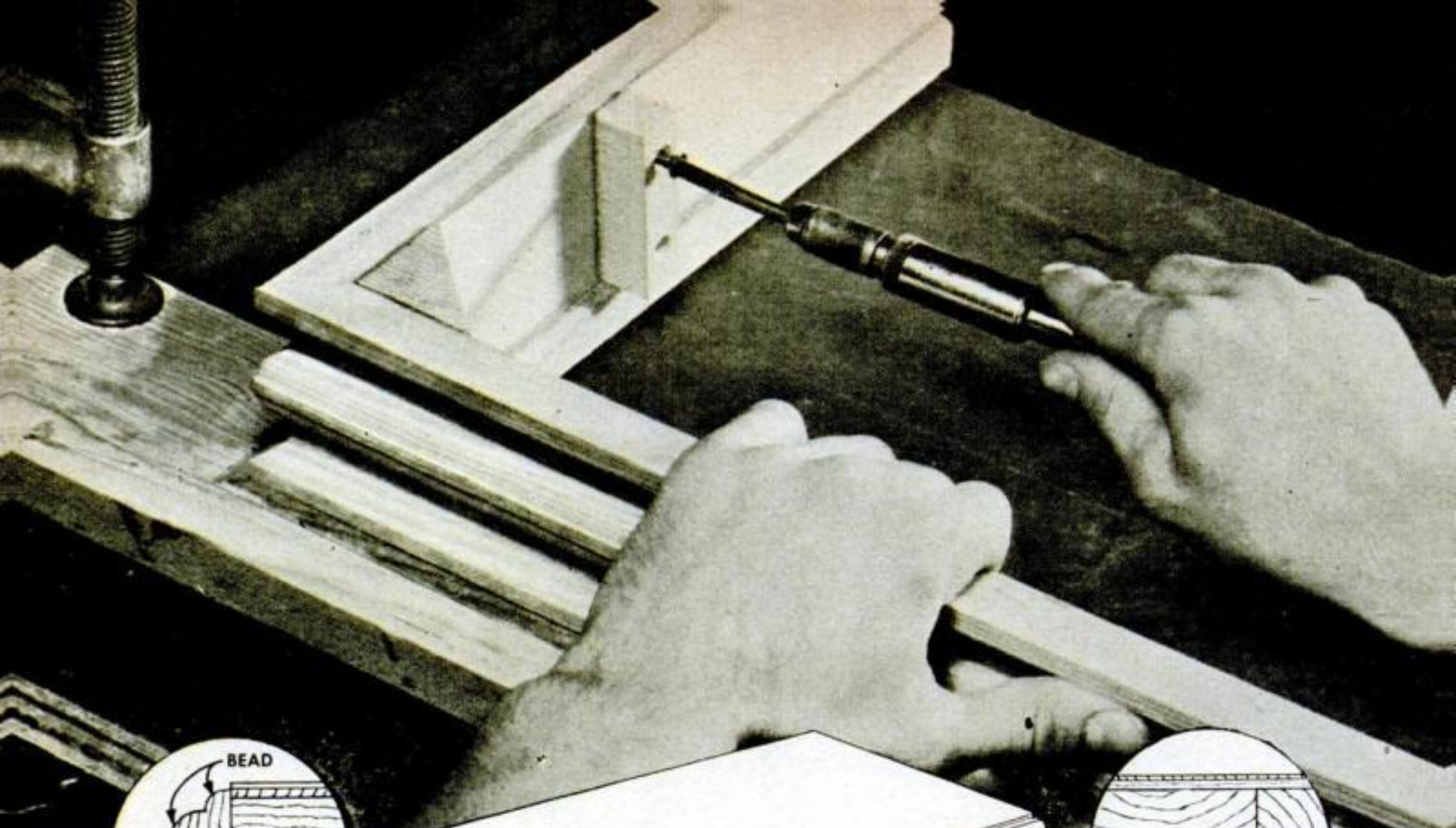
PAGE 192

PAGE 218

PAGE 230

PAGE 239





Common moldings. A sprung mold, shaped on the face of a thin piece, saves stock in corners.

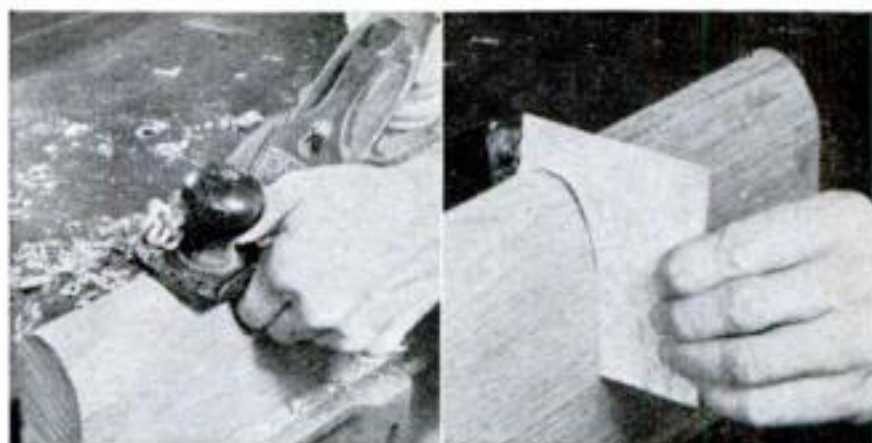
Moldings Make the Difference

Whether you use them to hide joints and edges or for ornamentation, shaped surfaces enhance your work.

By Edwin M. Love

THERE are many modernists who use the word "molding" as a cross between an insult and an epithet. For them, any furniture ornamentation beyond the simplest and most functional belongs only in the history books. Most of us can join them in their admiration of simplicity and forthright construction, but tradition is a sturdy thing. We still respect the work of craftsmen like Chippendale, Jacob, and Hepplewhite. Try to picture their masterpieces without moldings!

Let's not forget, too, that moldings can be functional. An applied bead and cove conceals the raw edges of a plywood table top, a quirk on a hanging stile camouflages the joint between it and the door, and a bead on a drawer front helps conceal the sliding clearance. The drawings on these pages illustrate other applications. Whether

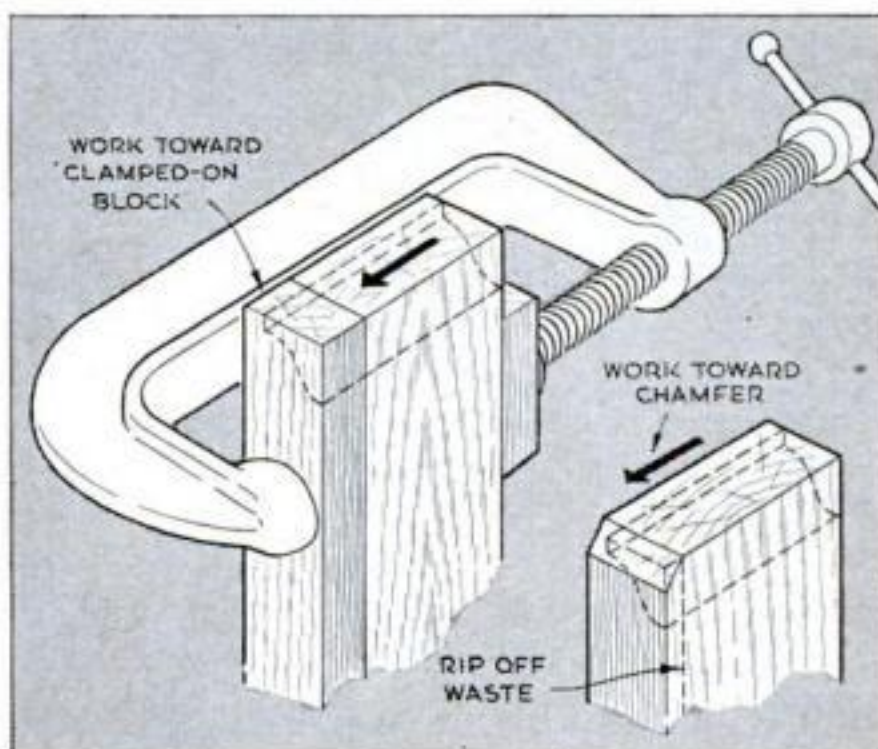


1. Rough a thumb mold with a hand plane by cutting corners repeatedly.

2. Test the contour as you work with a cardboard template. Use it to mark ends.



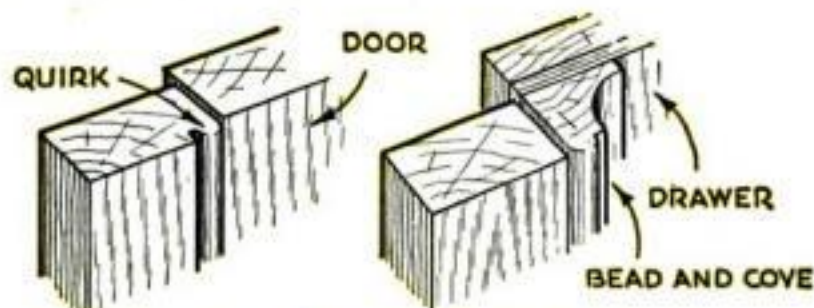
3. A rubber, or sanding block shaped to a reverse profile of the mold, smooths the edge.



4. In molding end stock, splintering can be prevented by either of the two methods shown.



COMBINATIONS OF BEADS AND COVES



DISGUIISING JOINTS WITH MOLDING

Combinations give moldings variety. Right, use molds to conceal door and drawer clearances.



5. Reeding, or beads set close together, is made by scoring between the beads with a saw.



6. Combination planes will make a variety of molds. Irons come in many styles.



7. Save costly wood by gluing a thin strip to a backing. Split it off after making mold.



8. Carving is called for in molding curved edges. Vertical chisel cuts mark the outline.



9. Horizontal strokes—with bevel up—level the molding to depth. Trim with bevel down.

your specialty is building period furniture or smaller projects such as boxes, bookends, and novelties, you'll find plenty of use for moldings.

Never mind if you don't own a shaper. You can make moldings by hand. Take the thumb mold, for example. This simple elliptic contour, while especially used in provincial furniture, is pressed into service in many other structures. It gives lightness to a heavy table or bench top without resorting to projecting angles that are soon worn down. The tools needed to make it are a plane, sandpaper, and one or two rubbing blocks hollowed to fit parts of the curve.

Cut a cardboard template (Fig. 2) and

use it for drawing the curve on the ends of the piece and also for testing the profile as it is being shaped. Rough the molding with the plane, as in Fig. 1, cutting chamfers and repeatedly planing down the corners. Accuracy depends on how steadily you can hold the angle of tilt throughout the stroke. Machinelike precision, however, isn't always necessary. Much of the charm of handmade provincial furniture lies in subtle irregularities of moldings and surfaces.

Use of a contoured sanding block, or rubber, is illustrated in Fig. 3. Press a piece of coarse sandpaper over the planed molding, and fold the sides up around the block for easy gripping. For fine sanding the waterproof type of abrasive paper may give best results, as it has a flexible backing that will follow the curves of the mold and rubber better than the stiff-backed abrasive paper. Use it dry, of course.

Shaping a semicircular bead on the edge of a board is but a step removed from making a thumb mold. Fit the rubber to the arc of the circle. Often a thumb mold or bead or quarter round is offset by rabbeting to form a fillet at one or both surfaces of the piece. You'll find a rabbet plane handy to work near the inside corners, and a cabinet scraper is good for cleaning off ridges preparatory to sanding with a rubber. Make the cloverleaf design by shaping quarter rounds on the fillets and a half round on the tongue.

A table or cabinet top requires molding of the ends as well as edges. It is good policy to shape the ends first so that if any splintering occurs when the plane or chisel exits at the far edge it can be cut away when the edge is shaped. It is sometimes possible to work from both edges. This minimizes splintering, but because the stroke isn't continuous there may be a tendency to crown or gouge the edge.

Two other methods for preventing splintering are shown in Fig. 4. In one the edge is left rough, and an allowance of $\frac{1}{4}$ " or more is made for trimming. The arris on this waste piece is nipped off in a chamfer, and there is no danger of splintering if you work toward the chamfer. Where nothing can be spared from the width of the work, the other method is useful. Clamp a buffer block to the far edge and work the mold through it. If there is any splintering it will be in the waste block and will do no harm. Make sure the block is clamped tightly.

Moldings can be worked on the edges of plywood if the piece is to be painted, but

there will be end-grain to seal and holes to be filled in some of the plies.

Reeding—or parallel beads set close together—flutes, or combinations of them are sometimes used to ornament surfaces of cabinet fronts. These can also be made with hand tools. For reeding, the first step is to score between the beads with a saw as shown in Fig. 5. Then chamfer with a rabbet plane and with light chisel cuts along the sides of the beads. Finish with the rubber. You can exercise your ingenuity and designing skill in combining small and large beads or coves.

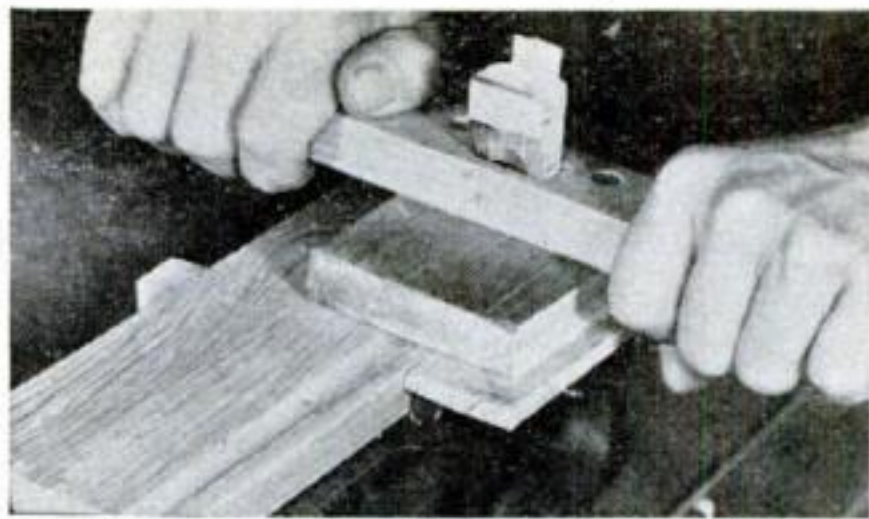
If you own a combination plane or can borrow one from a friend, you can make a wide variety of moldings with little difficulty. Extra blades of various patterns can be purchased. Use of the plane is illustrated in Fig. 6. Insert a bit, align the spurs with its edges, set the depth gauge and fence, and plane to depth. A trial cut will indicate the thickness of the shaving you should attempt. When one bead is made, shift the fence to bring the bit into position for the next. Use a round-nose cutter for flutes, and turn the spurs to a noncutting position. If beads are combined with flutes, plow grooves between the beads before working them and the flutes to shape.

Strip molding should be cut in the edge of a board and then sawed off after it is completed. To economize with expensive hardwood, glue the strip to a backing board with a ribbon of paper between. Make the molding; then split off the strip by driving the edge of a chisel into the paper joint (Fig. 7).

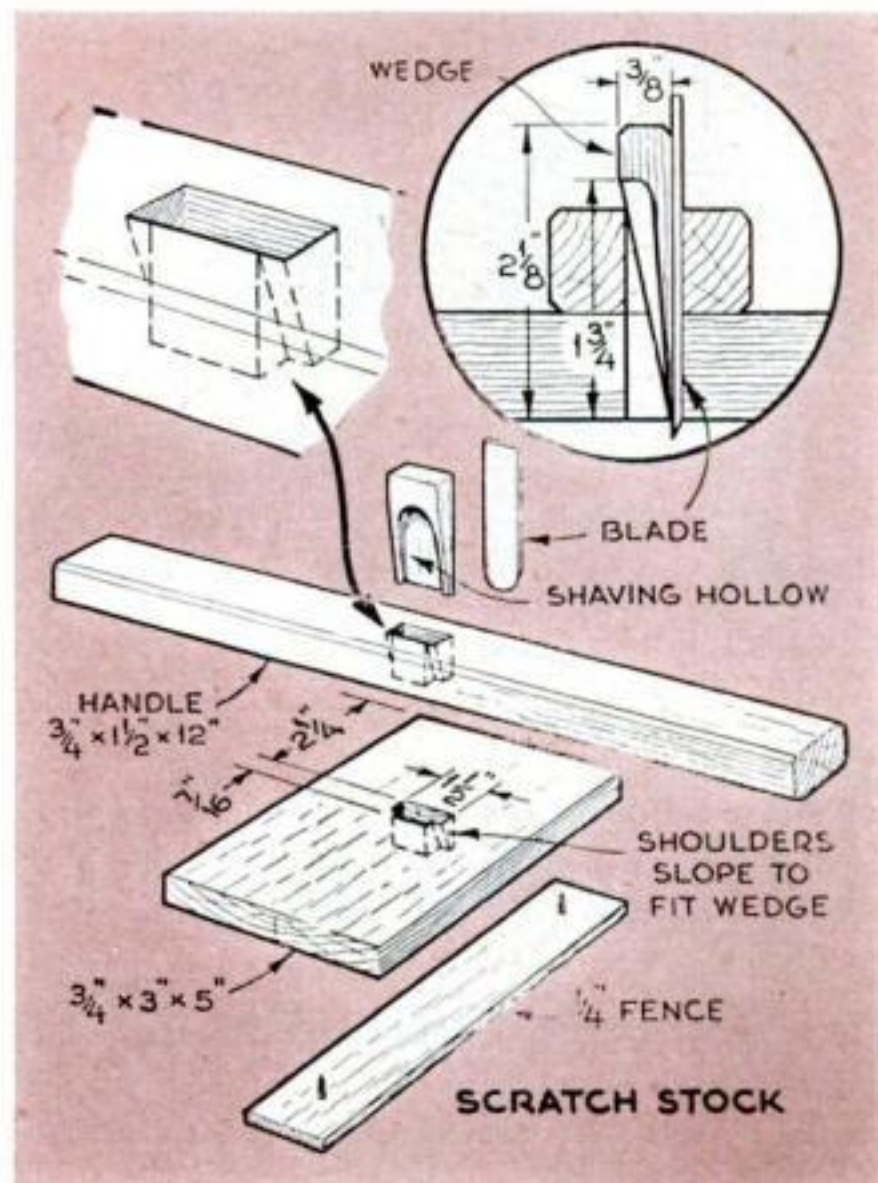
You can save material in large moldings by treating the face of a thin piece as if it were the edge of a heavy section or triangle. Such a molding is termed “sprung,” and finds wide use in inside corners and built-up assemblies such as cornices.

When a curved edge is to be molded, you'll have to resort to carving. The first stage in shaping a quarter round flanked by fillets is pictured in Fig. 8. Part of the molding has already been made in order to show the effect. Firm in the outline with a chisel. Level the molding to shape with horizontal strokes, and finally trim the round profile with the bevel of a flat chisel as in Fig. 9. It is necessary to work with the grain. A cardboard template is a big help in sanding the work.

One version of the old-time scratch stock—a tool for scraping moldings—is shown in



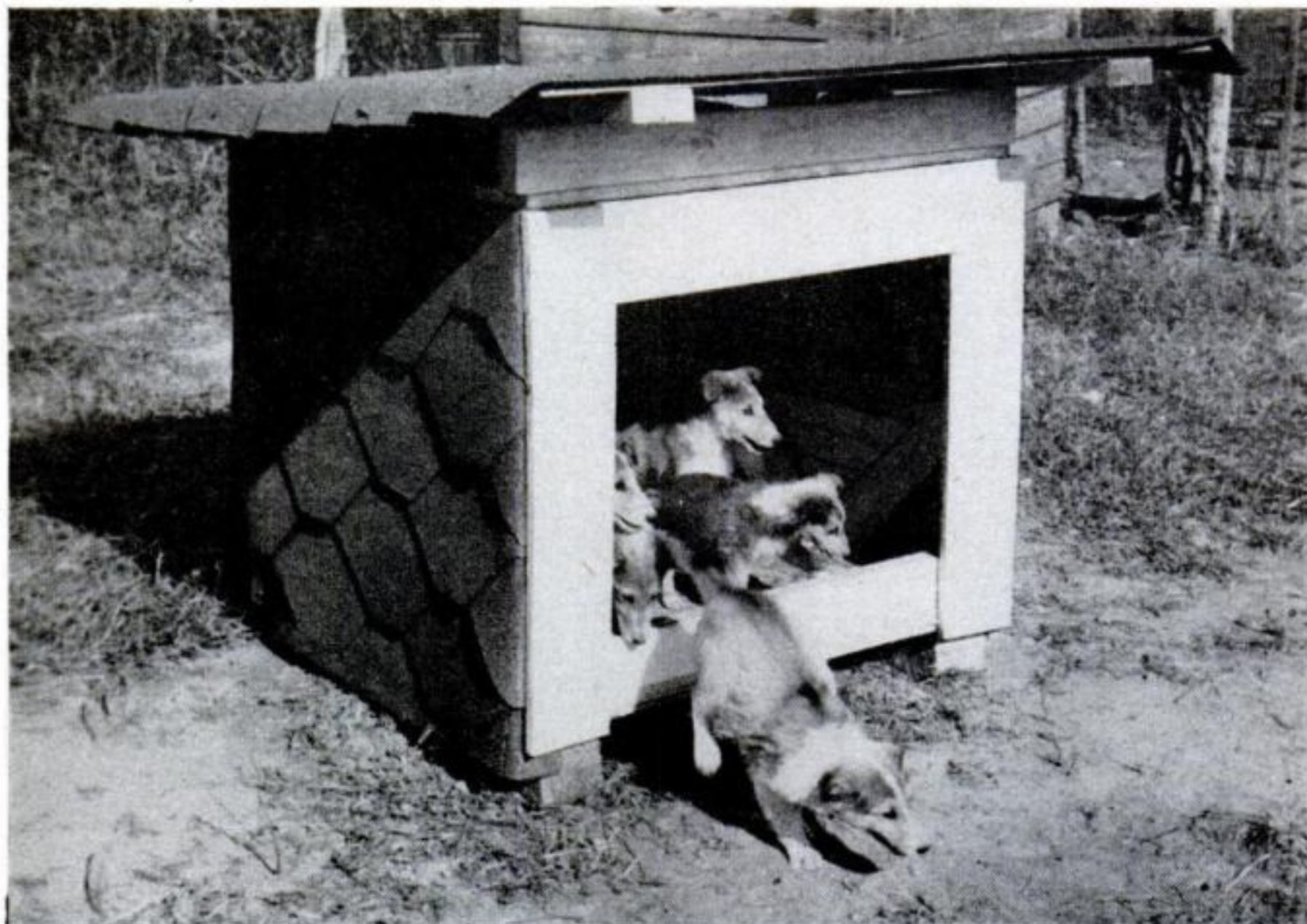
10. Scratch stocks with interchangeable blades can be used for making many different moldings.



11. The wedge as well as the slots in the body and handle is hollowed so shavings can escape.

Fig. 10; construction details are given in Fig. 11. The blade is ground or filed to shape and whetted sharp. An old cabinet scraper or saw blade furnishes the material. Clamp the blade with the wedge. The holes in the stock and handles are tapered to fit the wedge, and are relieved in front to allow shaving clearance. The wedge (which is also hollowed so that shavings can escape) bears on the shoulders of the openings. Fine adjustment of blade depth is not necessary, since the tool can be rocked forward for starting cuts, and you can slide it on its sole when the cut deepens. A tap on the upper end of the blade drives it down for a deeper cut.

END



Better kennels mean healthier dogs. Well insulated, this one is dry, warm, and easy to build.

Building a Better Doghouse

By Thomas William Helm III

WHEN you solve your dog's housing problem, do it right—whether he's just a pooch that followed you home or a pure-bred that cost you a few hundred dollars.

The first question that usually arises is how large to make the house. Here's a rule I've followed to answer that question: Build the house as wide as the full-grown dog is long, with the depth one and a half times the length of the dog. Make it high enough for him to stand up comfortably. These proportions permit the dog to stretch out in hot weather and yet keep the house small enough so his body heat warms it fairly well in cold weather.

Proper location of the house also is important. The east or south side of a building or a board fence is a good spot. Such shelters help keep the house cooler in summer and less exposed in the winter.

Double-thick flooring with a sheet of tar-

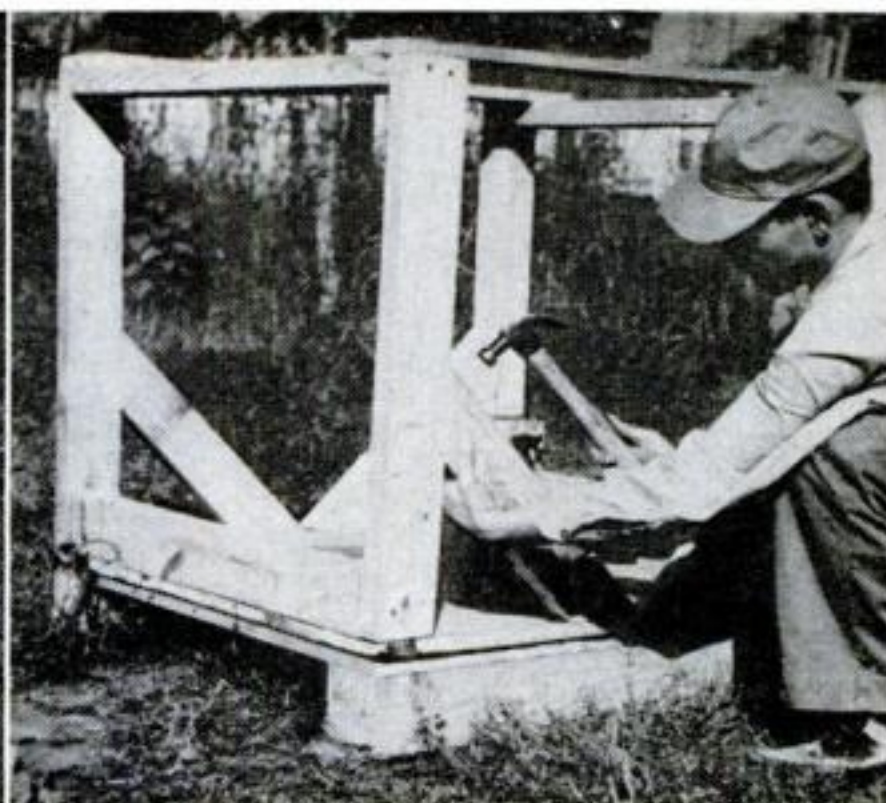
paper between will keep out drafts and dampness. Nail the subflooring to four-by-fours and rest them on bricks. That will raise the house high enough so air can circulate to dry the soil under it after rain.

Build the frame of four upright two-by-fours and top them with four horizontal two-by-fours. Brace all lower corners to increase strength. The next step is the roof and ceiling. Fit the ceiling boards together tightly and slope the roof for quick drainage. The space between the roof and ceiling will help protect the interior from the sun's heat. Any type of shingles may be used to cover the sides and roof. Leave the front of the house completely open after facing it with 4" boards. This means better air circulation in warm weather. In winter, hang a burlap curtain in the opening to keep out drafts and rain or snow.

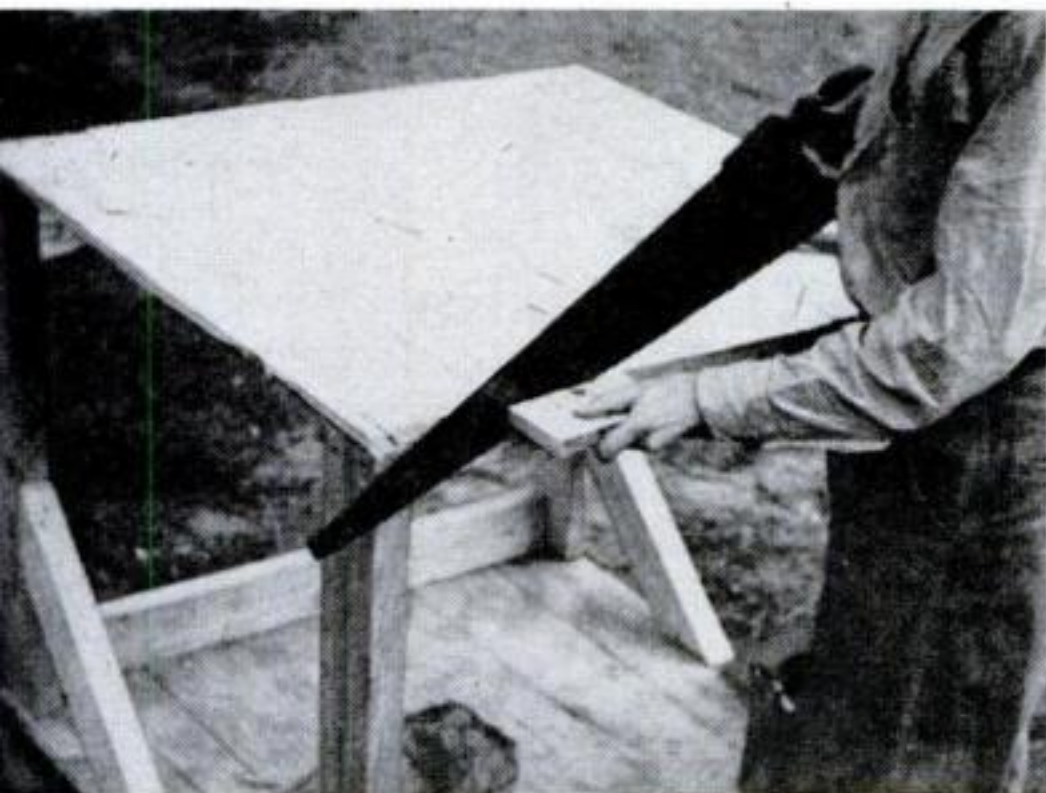
For bedding inside, avoid newspapers and rags—they hold dampness. Cedar chips or shavings are best.



1. Double-thick floors with a sheet of tarpaper between help provide a dry, draftless interior.



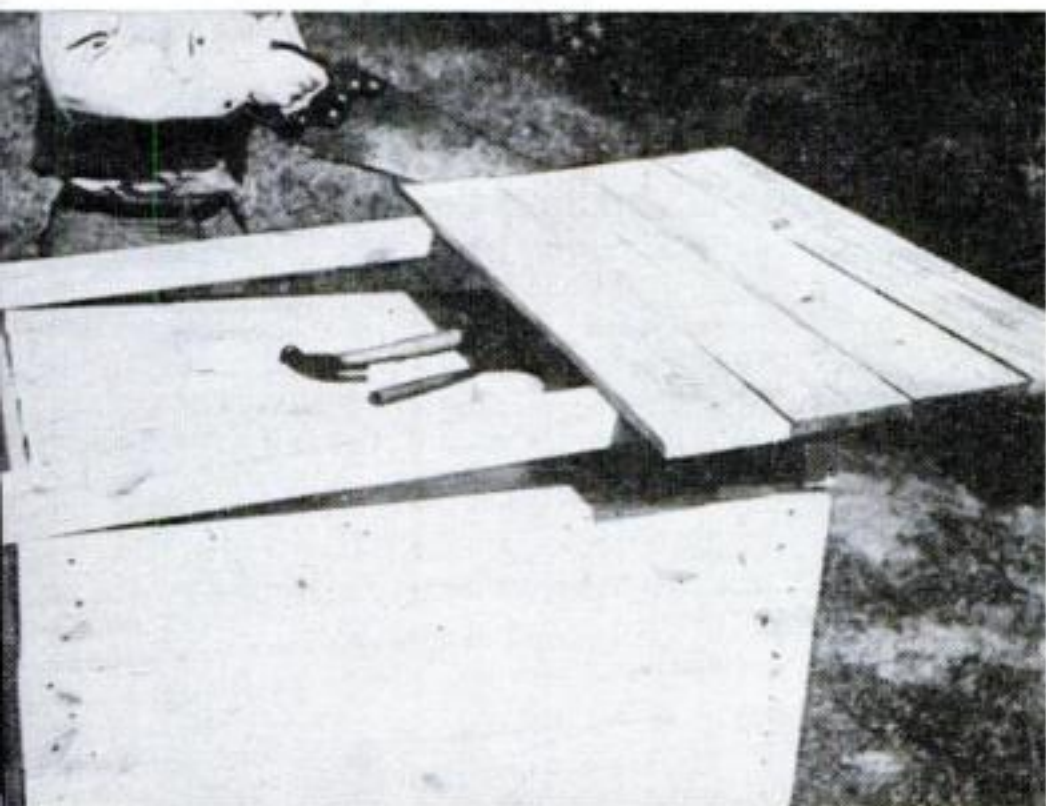
2. Brace each lower corner for extra rigidity. Added strength is needed when house is moved.



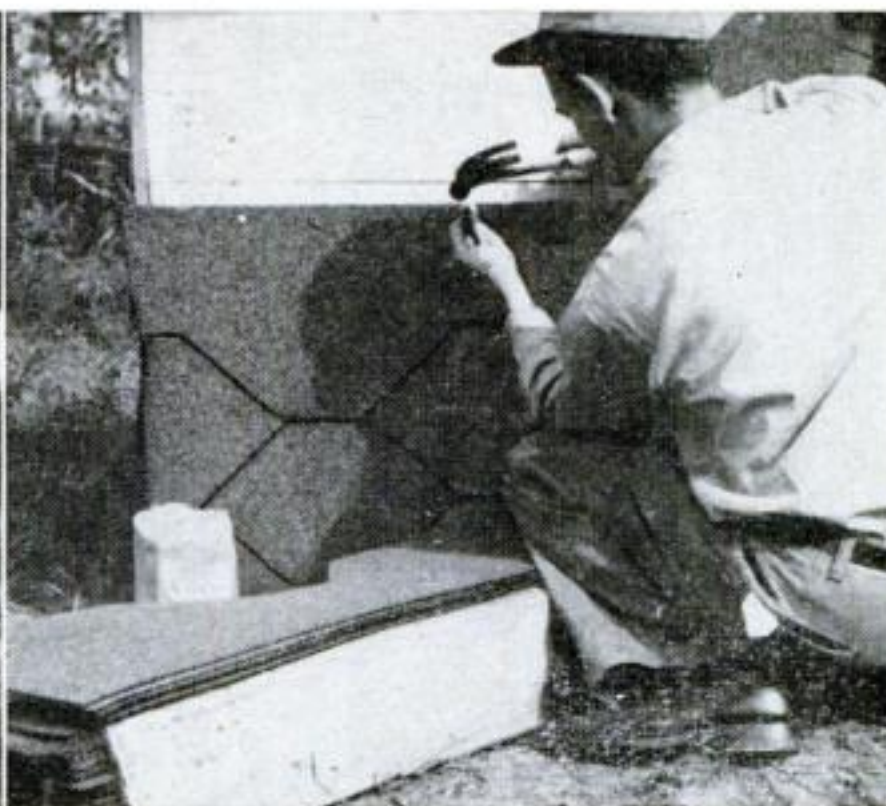
3. Ceiling boards should fit tightly. Space between roof and ceiling helps keep house cooler.



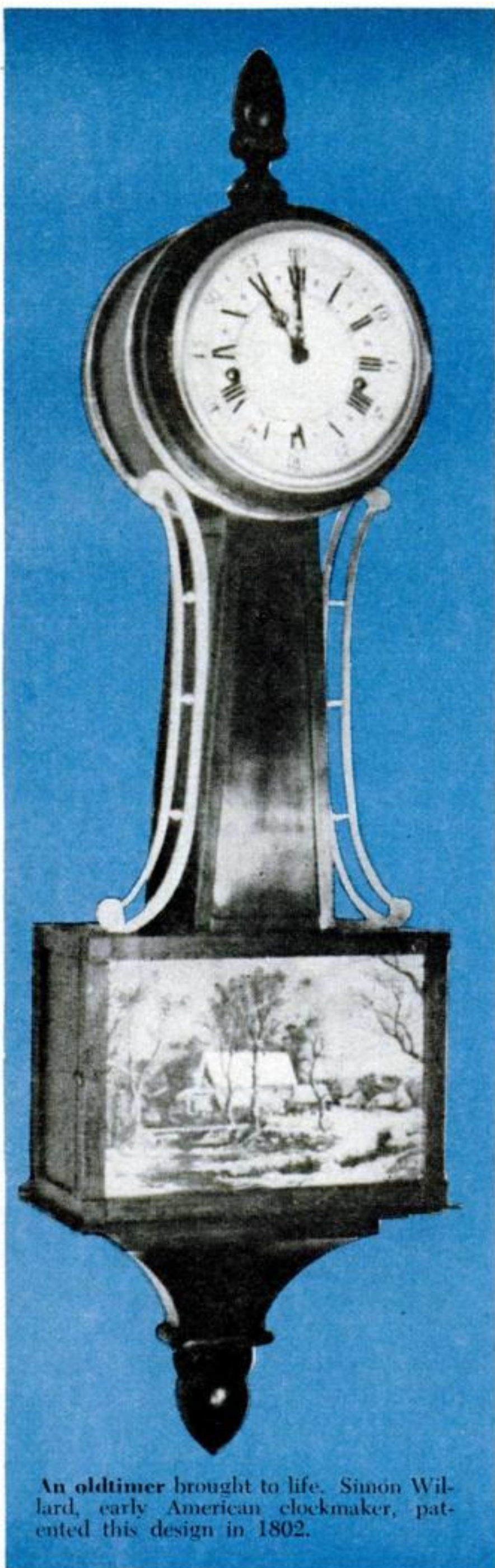
4. Dogs quickly learn to stay away from places where they get hurt, so inspect inside for nails.



5. Extend roof 1' in front and 6" on each side and rear. Slope enough to drain water quickly.



6. Cover both the roof and sides with inexpensive shingles to keep out drafts and dampness.



An oldtimer brought to life. Simon Willard, early American clockmaker, patented this design in 1802.

Banjo Clock Made of Walnut and Brass

By A. L. Elliott

PATTERNED after a type of timekeeper that gained great popularity in the early years of the last century, this banjo clock makes a handsome addition to a room furnished in Early American.

Its case, made of walnut, is decorated with brass. The barrel that holds the works was turned on a lathe. Dovetail joints are used in the throat and lower box.

The first thing to do is to obtain the works, since the size of the barrel will depend on that. If a good works from a mantel clock is available, you have the advantage of a rim and crystal—and perhaps a face—ready for use. The design shown here is for a fairly large works. If the one you use is smaller, alter the dimensions to suit.

Follow the nine steps in the drawing on page 200 to turn the barrel. First glue up scraps to form the main part of the barrel. Use a solid piece, however, for the front since it will not be covered by veneer. After fastening the faceplate to the softwood plug, turn a recess in the solid piece to suit the works plate or face of the clock. Then turn the outside of the barrel. Take the work off the faceplate, turn it around, and remount

with the faceplate in the recessed end. Cut out the plug and inside of the barrel, turning all the way through the solid piece. Lastly, apply glue all around the barrel and fit the 1/28" walnut veneer. Use sheet rubber or cork between the veneer and clamps.

If you use a clock with a pendulum, check to see how much room is needed for its swing before you begin to build the throat. Then cut the four sides from 3/8" stock, using the prettiest piece for the front. Dovetail the edges at 1" intervals. Go ahead and glue up the throat.

The lower box is made next. Sides are 3/8" stock and the base is a 3/4" piece. Note the two rounded steps under the base piece. Rabbet them out, sand them round, and cut the upper part to fit up inside the ends and sides of the lower box. Small strips are glued inside the box 1/4" from the back. The back panel of 1/4" walnut plywood is fitted inside the box and screwed to these strips.

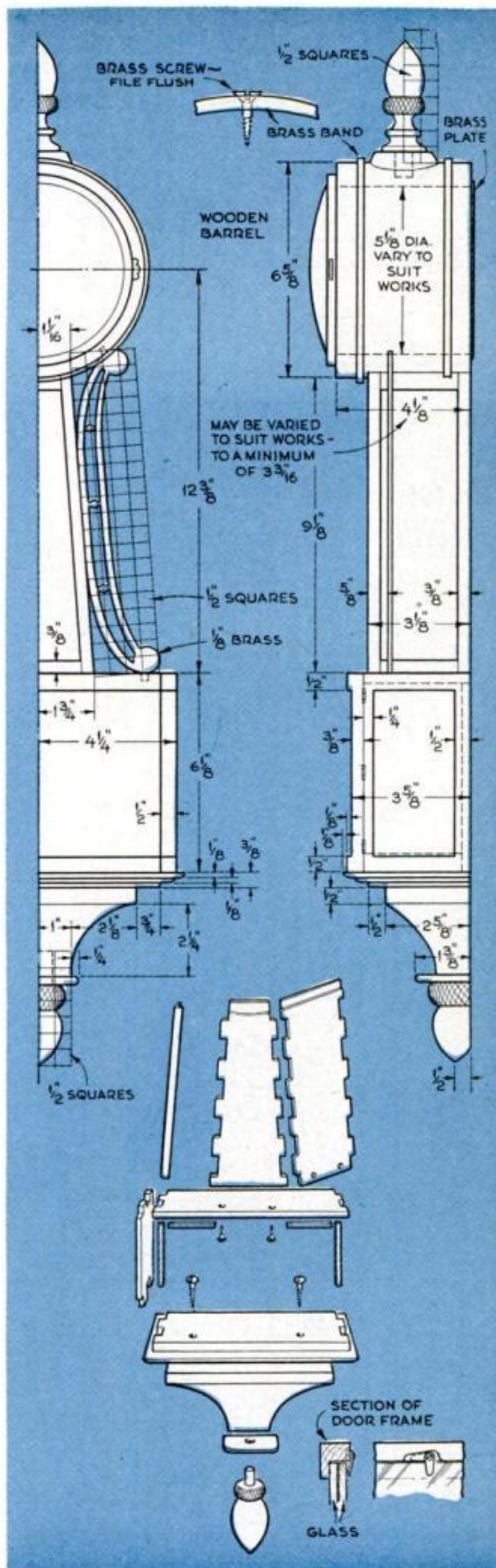
Next saw out and finish the lower bracket and screw it to the bottom of the box. Throat and box then can be screwed and glued together. Don't fit the barrel to the throat until you're ready to install the side rails. These brass rails are the show pieces of the clock, so do them carefully. Cut them from 1/8" brass—don't forget the studs that fit in the barrel and box—and smooth them down with a file and emery paper. After final polishing, give them a coat of clear lacquer.

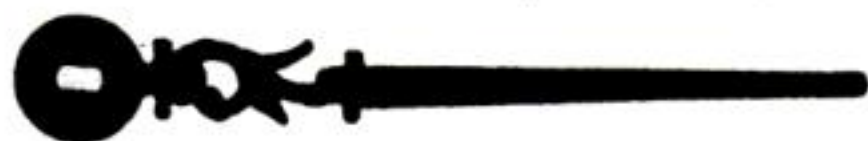
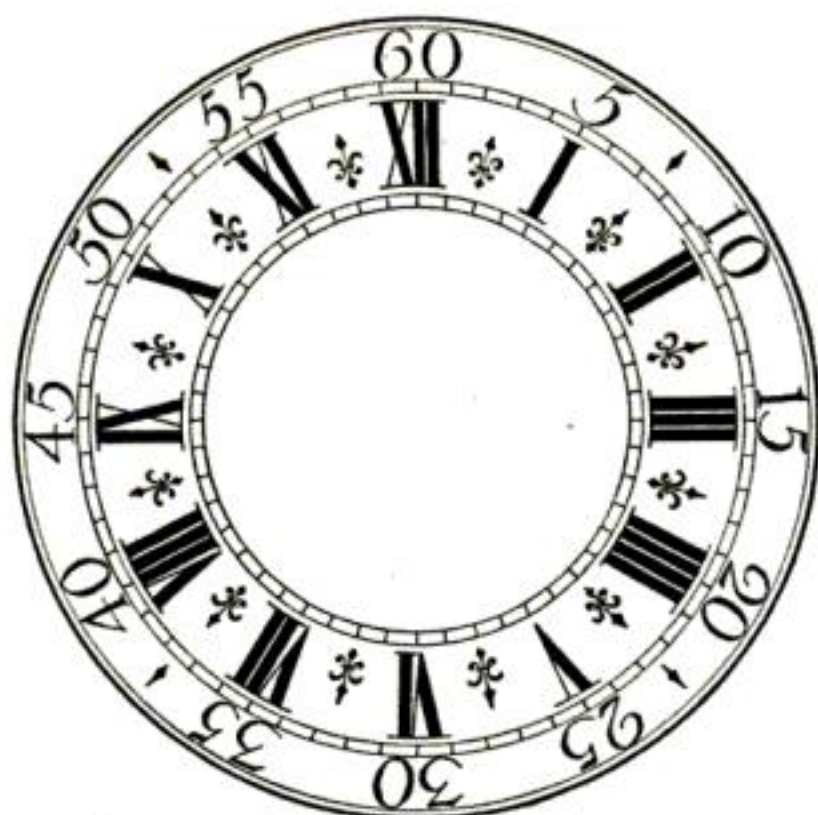
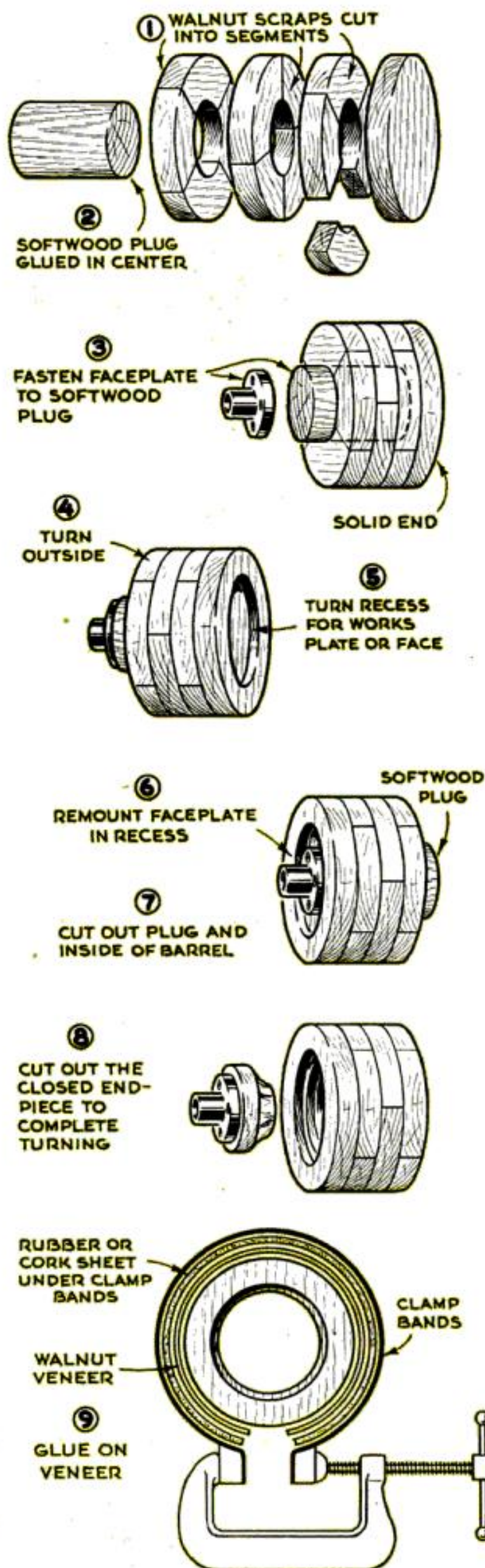
Cut a hole in the barrel to fit the rabbets on the throat. Next bend the two 1/8" brass bands that circle the barrel. Drill about five holes in them and fasten them to the barrel with flathead brass screws and file the heads flush. Fasten the throat and barrel together with glue and screws, fitting in the brass side rails at the same time. The 1/16" by 3/8" by 3/8" walnut corner angles for the front of the throat may be made with a rabbet plane and then glued in place.

Make the picture frame to fit the front of the box perfectly. Rabbet the pieces of frame to just take the two pieces of glass and the picture. By making the glass removable, the picture may be changed when desired. A Currier and Ives print goes well with this type of clock. Swing the door on three small brass butt hinges.

Turn the decorative acorns for the top and bottom carefully, carving the caps in about 1/8" squares.

If you have to make a face for your clock, cut it from 18-gauge half-hard sheet brass. Drill the center hole and the holes for the





For the average works of this type of clock, the hands outlined above are about the right size. Photograph or photostat the face, and blow it up to fit the size works you use.

winding and adjusting keys and smooth all edges with emery cloth.

There are a couple of ways you can put the numerals and decorations on the face. The simplest one is to photostat or photograph the picture of the face given here. Blow it up to the right size and glue it to the brass plate. Then cover it with a couple of coats of clear lacquer. Or you can enamel the plate white and with a photo negative of the face in an enlarger, focus on the enameled plate. Then draw the numerals on the plate with India ink. Brush on clear lacquer when the ink is thoroughly dry. The hands shown in the drawing can be traced and cut from the same brass as the face. After sawing them out, finish them with small files and emery paper and apply black japan or enamel.

The finish you give the walnut is important. Sandpaper the entire case to a glass-like smoothness and apply walnut stain and walnut filler. Follow with three coats of hard varnish, rubbing between coats with wet No. 400 or finer abrasive paper. Rub the final coat of varnish with No. 600 wet paper followed by pumice stone and paraffin oil for a rather dull finish.

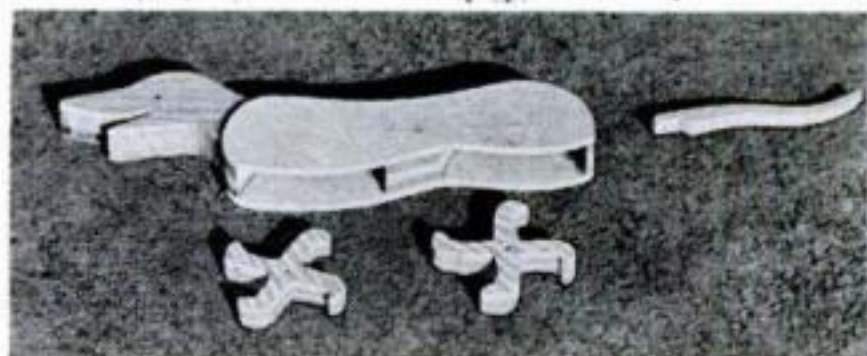
END

Toy Pooch Runs with Car

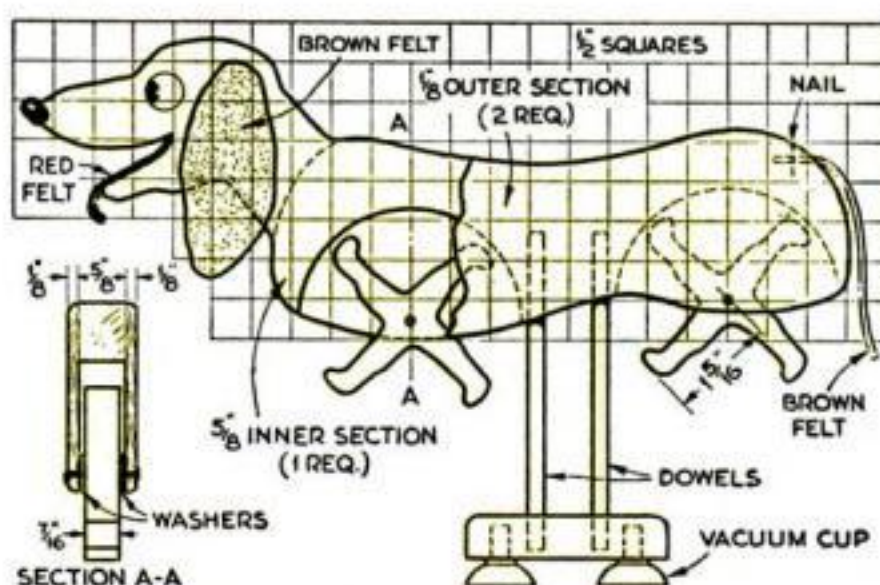
AT WHATEVER speed you drive, this toy dachshund will keep up with you, his short legs spinning and his long ears flapping. Mount him on a fender and he'll keep a child amused on a long drive.

The four legs in each unit are scroll-sawed and mounted on a wire nail. Only two legs of each unit are visible at a time, but they'll spin in the slightest breeze. Drill the holes for the nails slightly large for free turning and place thin washers on each side.

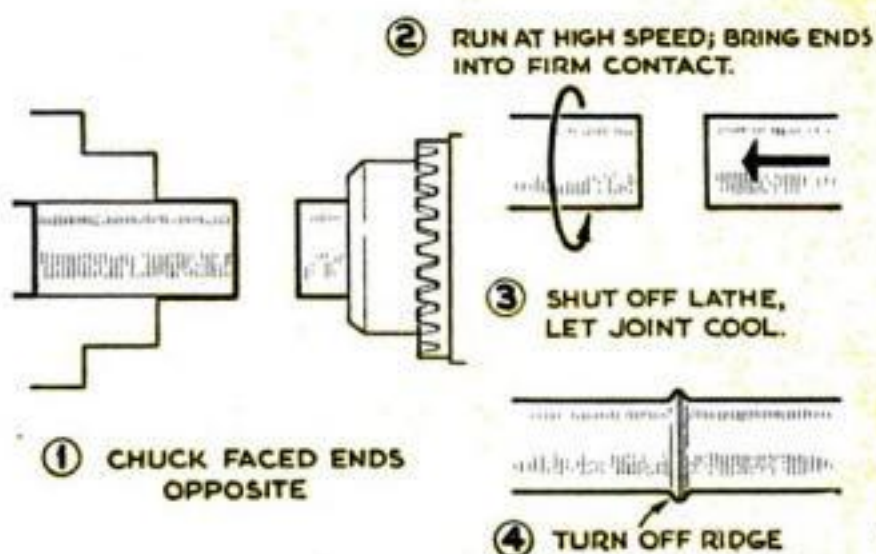
Cut the inner part of the body and the head from one piece of $\frac{3}{8}$ " stock, with two half-round cutouts for the leg units. The two sidepieces of the body are $\frac{1}{8}$ " plywood. Glue them on before putting on the ears, red felt tongue, and eyes. Tack on the brown felt ears from the underside. When they hang down, the tacks will be concealed. The tail also is brown felt and is nailed into a saw kerf as shown in the drawing. You can cut the eyes from white gummed paper and ink in the darker parts. Paint the body chocolate brown, the belly and legs tan, and the feet brown. Then drill holes in body and base for the dowels.—Hi Sibley, Nuevo, Calif.



Completed toy is seen in top photo. Wooden tail pictured was discarded for one made of felt.



Head and inner part of body were cut from one piece of $\frac{3}{8}$ " stock. Sides are $\frac{1}{8}$ " plywood.



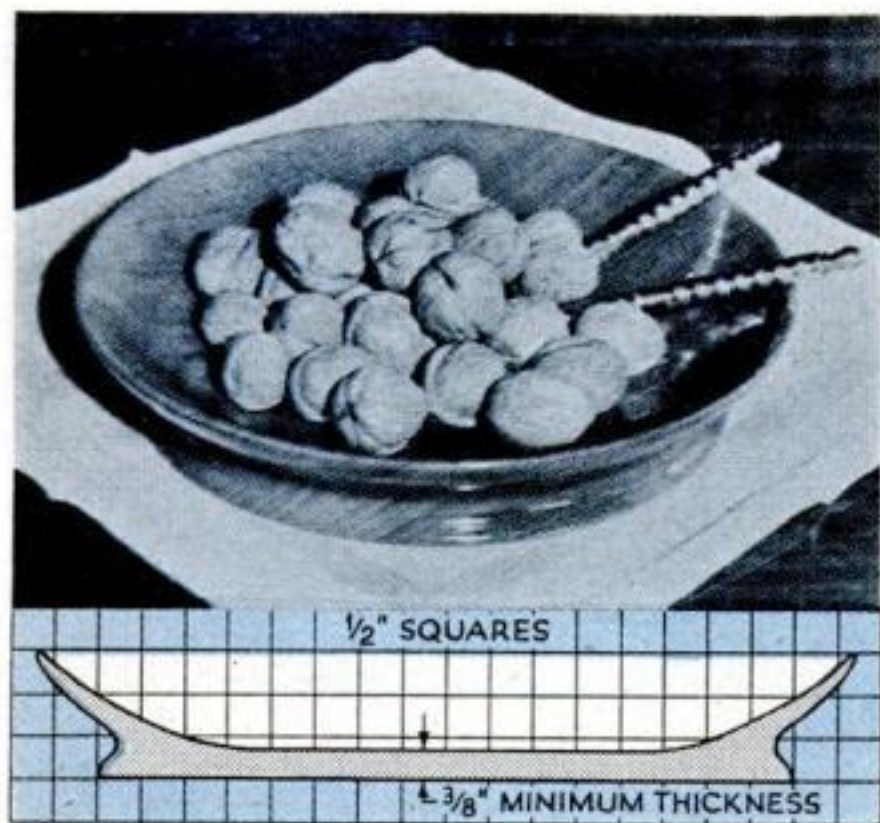
Big One Made from Little Ones

Two short pieces of plastic rod can be fused into one length by following the steps outlined above. First face off the ends of the short pieces. Chuck one in the tailstock and the other in the headstock with the faced ends opposite. Run the lathe at high speed and bring the ends of the rods together firmly. This fuses the two pieces. Shut off the power and let the joint cool. Then turn off the ridge.—C. P. Desire, Bronx, N. Y.

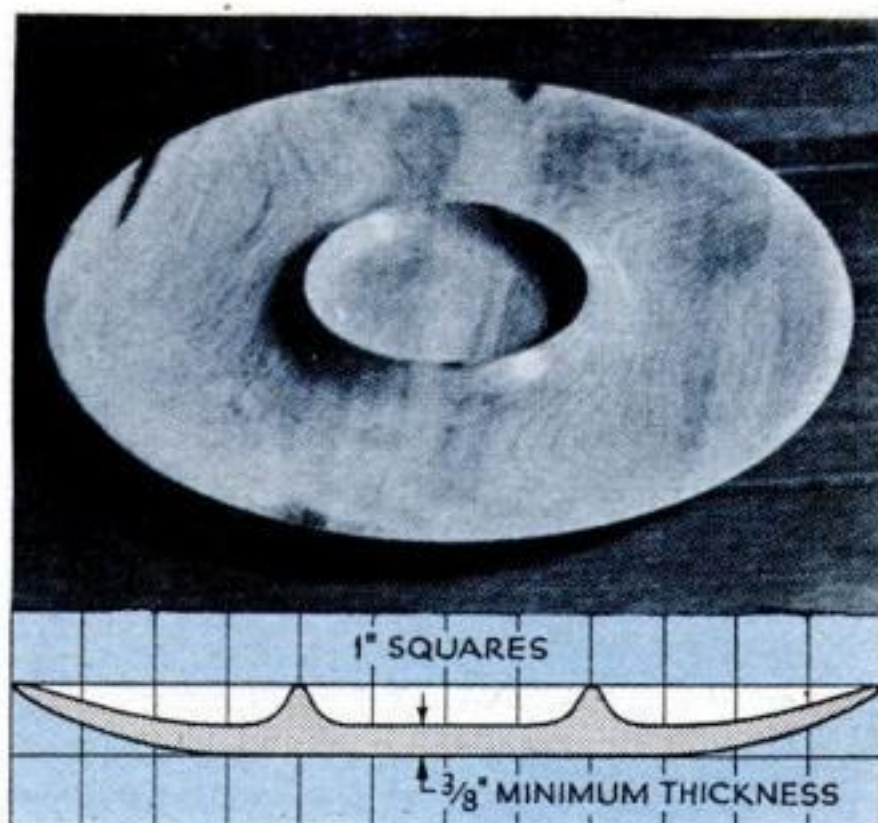


Ratchet Fits Socket Wrenches

THE handy principle of ratchet screwdrivers, braces, and other tools is duplicated in this compact tool that changes any $\frac{1}{2}$ " socket wrench into a ratchet wrench. Made by Willard G. Gregory and Company, of Los Angeles, the tool has male and female ends. The ratcheting direction is reversible. Useful in the home and shop, the ratchet adapter also makes it easier to unscrew the lugs when changing a tire.



Turned from solid hardwood blocks, this tray and bowl are attractive additions to a buffet or table. Both, of course, are lathe jobs. Use



well-seasoned stock. If this is unavailable, rough-turn the projects and then lay them aside a few weeks for additional seasoning.

Turned Bowls Hold Nuts and Snacks

THESE two projects—a nut bowl and a sandwich tray—provide an interesting evening or two at the lathe and also make pleasing additions to your wife's serving platters. Lewis Johnson, of Bremerton, Wash., turned each one from a solid block of well-seasoned hardwood.

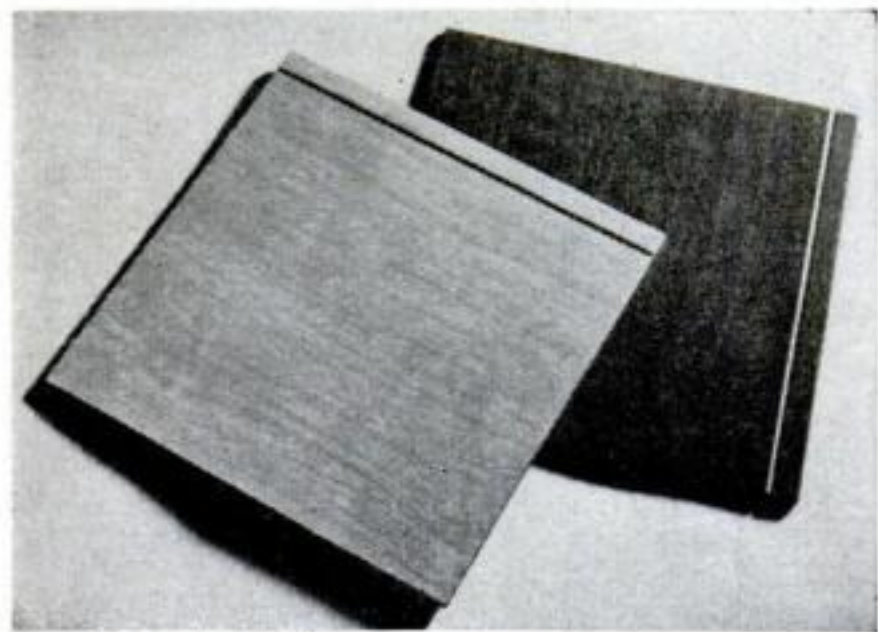
Mount what will be the top of the tray or bowl on the lathe faceplate and turn the bottom first. Make sure the screws do not penetrate beyond the waste material that will be removed in turning the inside. After turning the bottom, sand it smooth while it is still on the faceplate.

To turn the inside of these pieces, glue

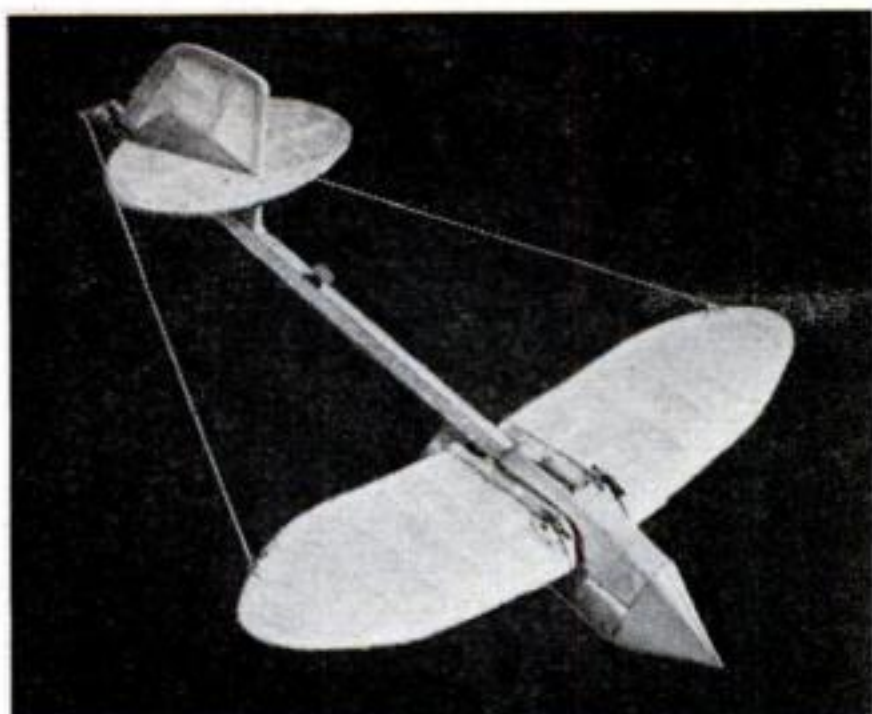
the bottom to a wooden disk with a layer of paper between. The faceplate screws can then go into the disk, leaving no holes in the work. Don't use waterproof glue, since you'll want to separate the turned pieces from the waste disk by soaking them off with a damp cloth. (Soaking directly in water will swell and warp the turning.)

If you prefer to save the time and trouble of gluing, you can screw the work directly to the faceplate and glue a piece of felt on the bottom of the finished project to hide the screw marks. After thorough sanding, the pieces may be varnished or finished with lacquer.—Edward R. Lucas, Poulsbo, Wash.

Wood-Grain Finish Lithographed on Wallboard



REALISTIC wood graining is put on a Presdwood® base by a lithographing process that uses a graining ink, ground coats, and finishing materials. A coating of clear lacquer is included to protect the finish. Made by the Service Products Division, Woodall Industries, Inc., Chicago, Ser-Wall® panels are available in a number of sizes from 16" by 72" to 4' by 8'. Edges are beveled and borders scored so they can be butted together and nailed in the score lines over existing walls. Price is about 33 cents per square foot. The panels can be washed.



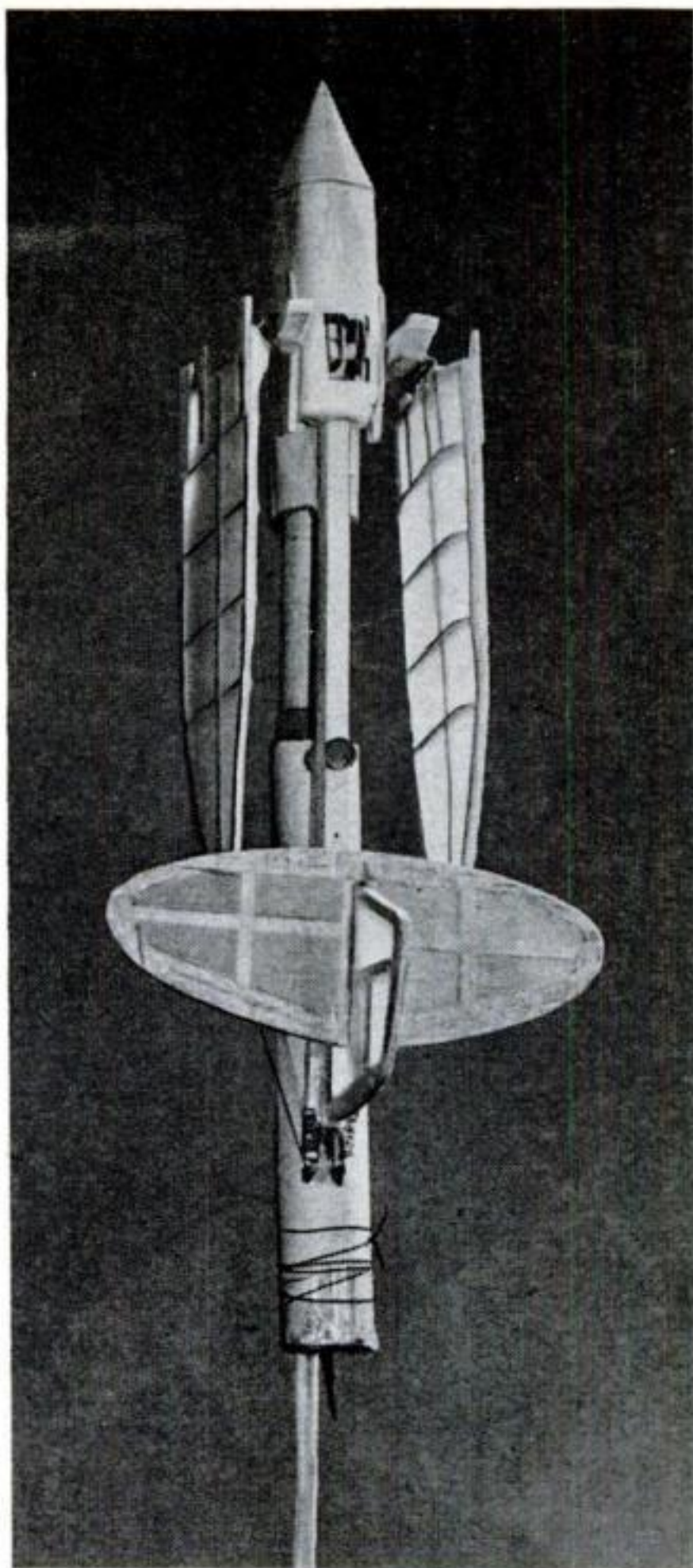
This is how the plane looks gliding down after the rocket tube drops off and the wings unfold.

Powder Rocket Unfolds Wings for Gliding

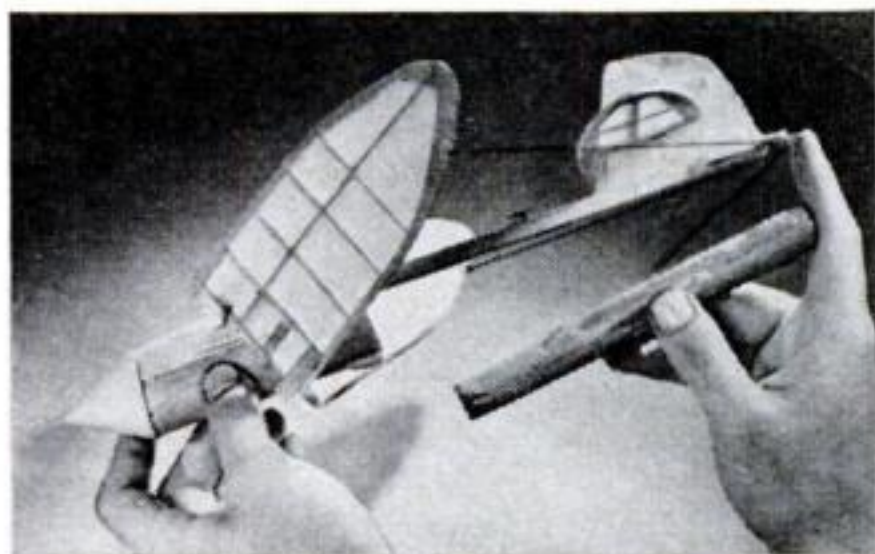
THIS rocket plane zooms 300' up and then unfolds its wings to glide down.

Tom Vasilos, of Long Island City, N. Y., 19-year-old physical chemistry student at Brooklyn College, built the plane of pine and balsa. He also makes the rocket—a paper tube with about 1 oz. of black powder.

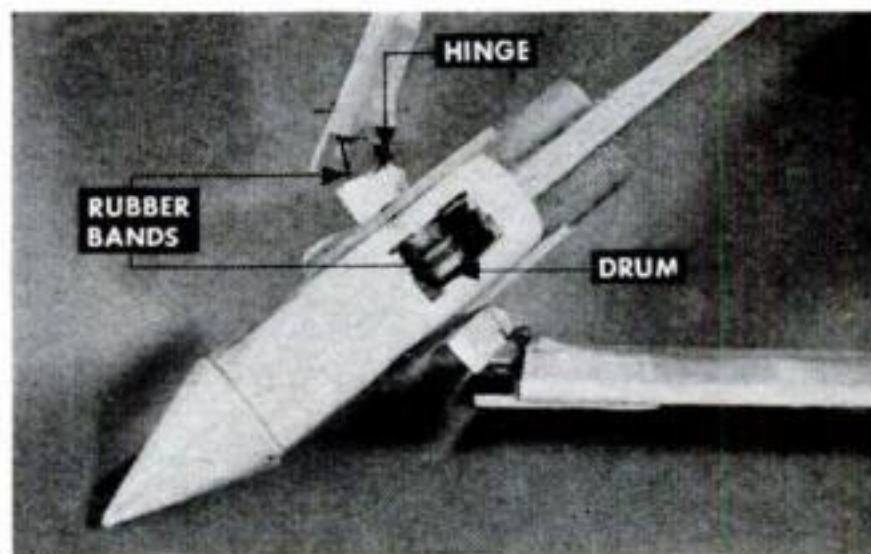
The ingenious wing arrangement—powered by rubber bands—uses both hinges and a pivot to put the wings in gliding position. A thread runs from each wing tip through screw-eyes at the tail. A hook on the rocket tube catches the thread and pulls the wings back when the tube is pushed into position. As long as the rocket drives upward, the wings are held back. When fuel is exhausted, the tube drops off and the wings unfold and rotate 90 deg. to glide.



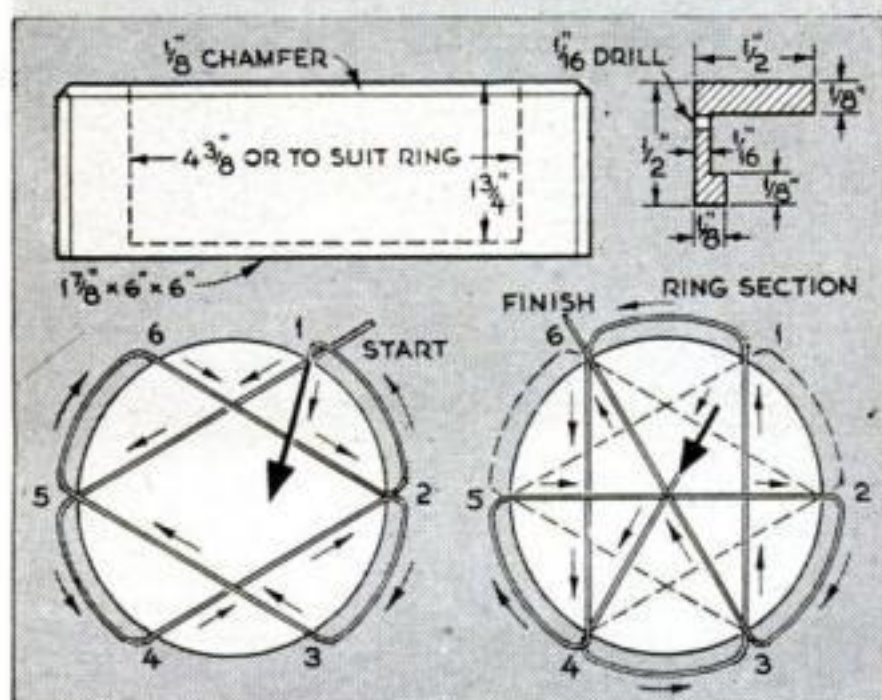
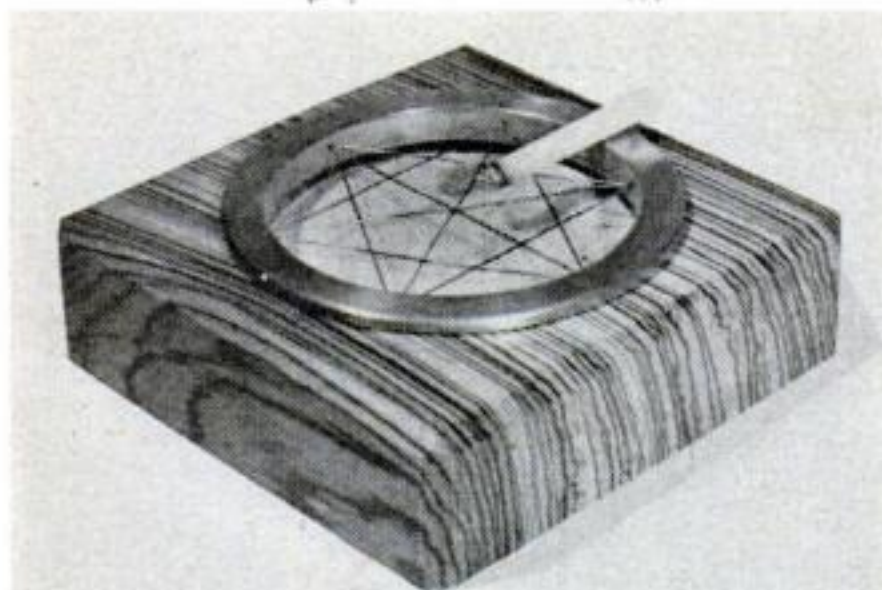
Ready for firing. Rocket, tube, and stick drop off when fuel is exhausted and the thrust stops.



Rocket tube, about to be inserted, is pulling the wings back alongside the slender fuselage.



Rubber bands pull wings forward. Another band in the nose rotates drum to level wings.



Suitable for living room or study, the gleaming copper center contrasts with the wood base.

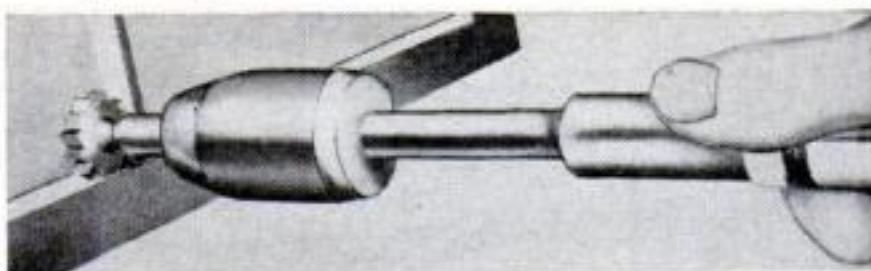
Hardwood Block Makes Ash Tray

I USED zebra wood for the man-sized ash tray shown here, but almost any hardwood will do—especially a burl. The center part that holds the ashes is rimmed by a copper ring laced across with piano wire.

First, mount the block on a faceplate and turn the recess as indicated in the sketch. Chamfer the top edges of the block. Then sand well and apply filler, two coats of boiled linseed oil, and five or six coats of paste wax—or use your own favorite finish.

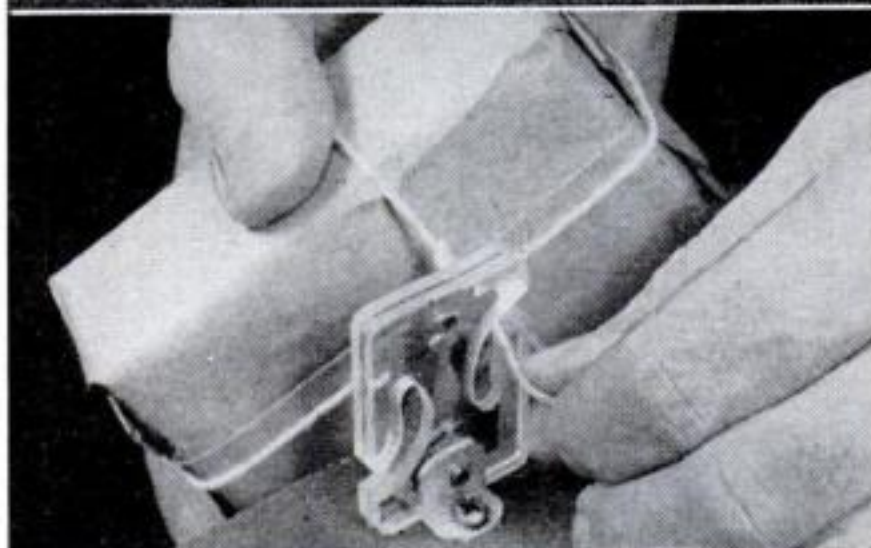
Turn a copper or brass ring to the dimensions shown. Divide it into six equal parts and drill. Silver-solder an end of a 48" length of piano wire alongside the No. 1 hole and thread the wire back and forth as shown in the drawing. Keep the wire taut and silver-solder the other end at the No. 6 hole. Then buff and lacquer the ring. I used white sand in the recess to catch the ashes, but a metal cup could be spun to fit under the ring.—R. B. Carlson, Seattle, Wash.

Keyway Cutter Removes Putty



WITH about 40 storm windows to refinish, I found the going tough when it came to removing the old, hard putty. I picked up a discarded industrial keyway cutter, sharpened it, and chucked it in a flexible-shaft tool to cut away the dried putty. It runs flush against the glass but, unlike a chisel, it doesn't start cracks. When sharpening an old cutter, give the teeth a slightly steeper rake.—E. F. Lindsley, N. Prairie, Wis.

Cord Cutter in Plastic Case



HERE'S a handy gadget for cutting cord that utilizes old razor blades. It's two pieces of 1/8" plastic with curving slots to expose some of the blade edges. The pieces are clamped to hold the blade with two small screws. Top photo shows its actual size. Bottom photo shows it attached to the edge of a bench by a small angle bracket. Since the plastic acts as a guard, it can be carried safely in the pocket.—J.F. Gréce, Manhattan, N. Y.

Cactus Grows in Glass-Case Lamp

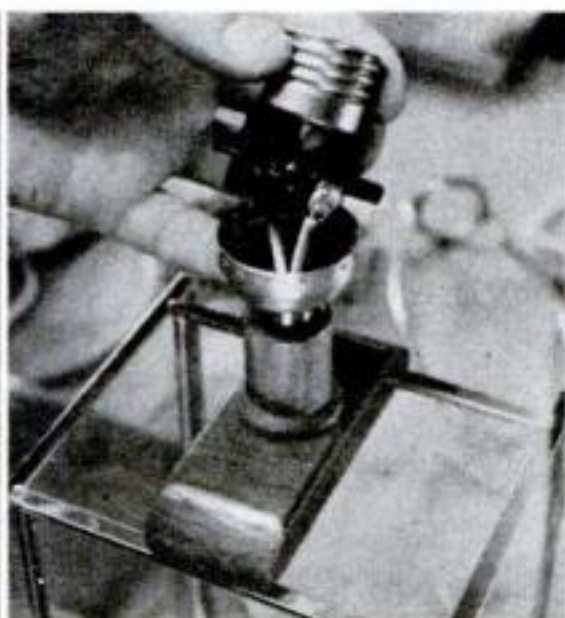
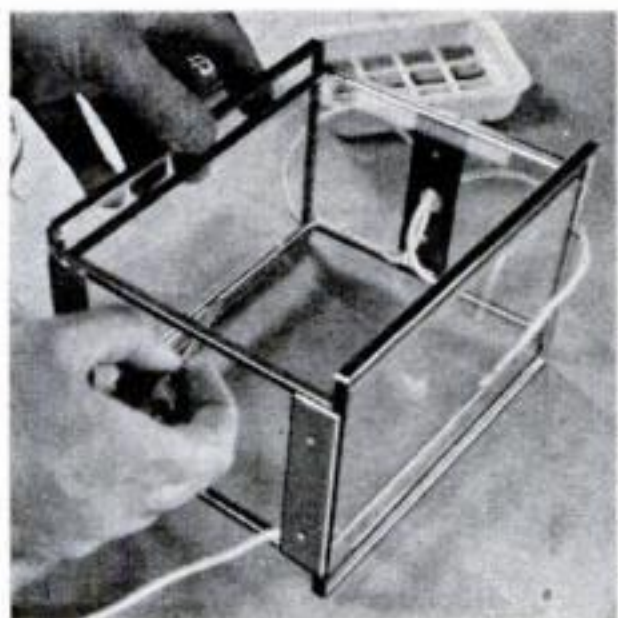
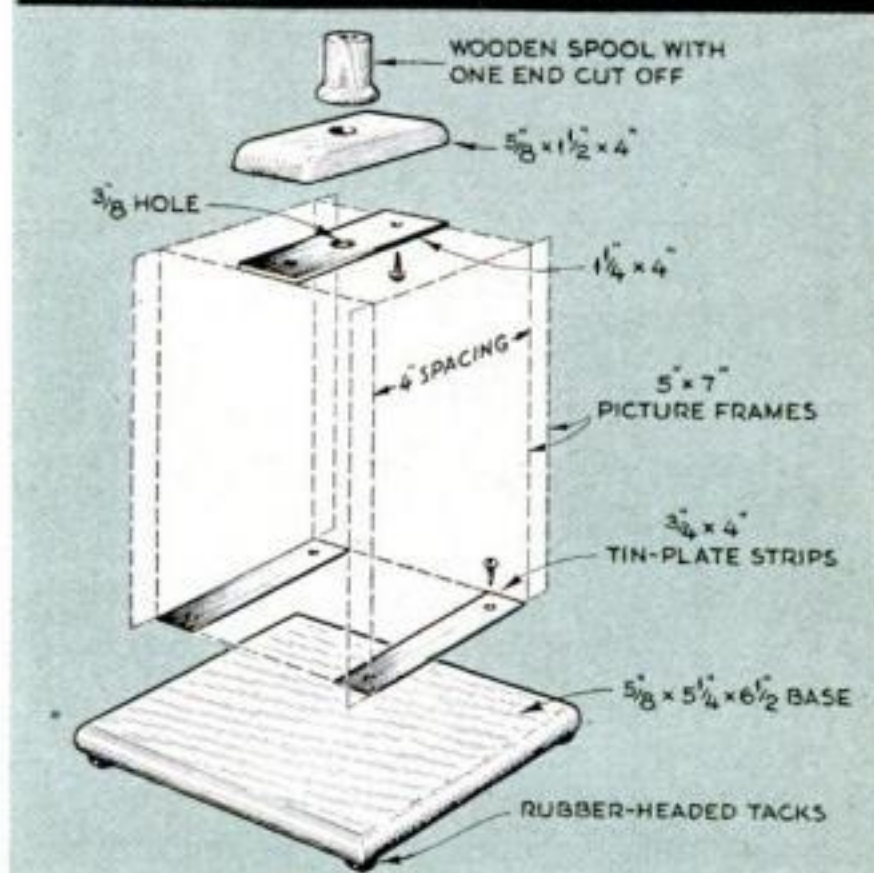
RATHER than have both a pot of plants and a lamp on one table, I combined them in this project. All parts were bought at a dime store, and making it is mainly an assembly job.

The glass walls are 5" by 7" nickel-plated picture frames with the cardboard backs removed. Only a little solder is needed to hold them together. The $\frac{3}{4}$ " by 4" tin-plate strips, soldered to the bottoms of the frames, were cut from a tin can. Drill these strips for wood screws to hold the case to the base. The tops of two frames are joined by another strip of metal. Use triple-folded tin plate or a single thickness of heavier stock.

A small breadboard provided more than enough wood for the base and toppiece. The neck of the lamp is a spool with one flange sawed off. Drill two holes near corners of the base for wiring and enlarge the hole in the spool to take a $\frac{1}{8}$ " pipe nipple $2\frac{1}{4}$ " long.

For a plant holder, I used a plastic soap dish. This dish had a small grille in it. I saved the grille out and stuck it upright in the dish to act as a trellis.

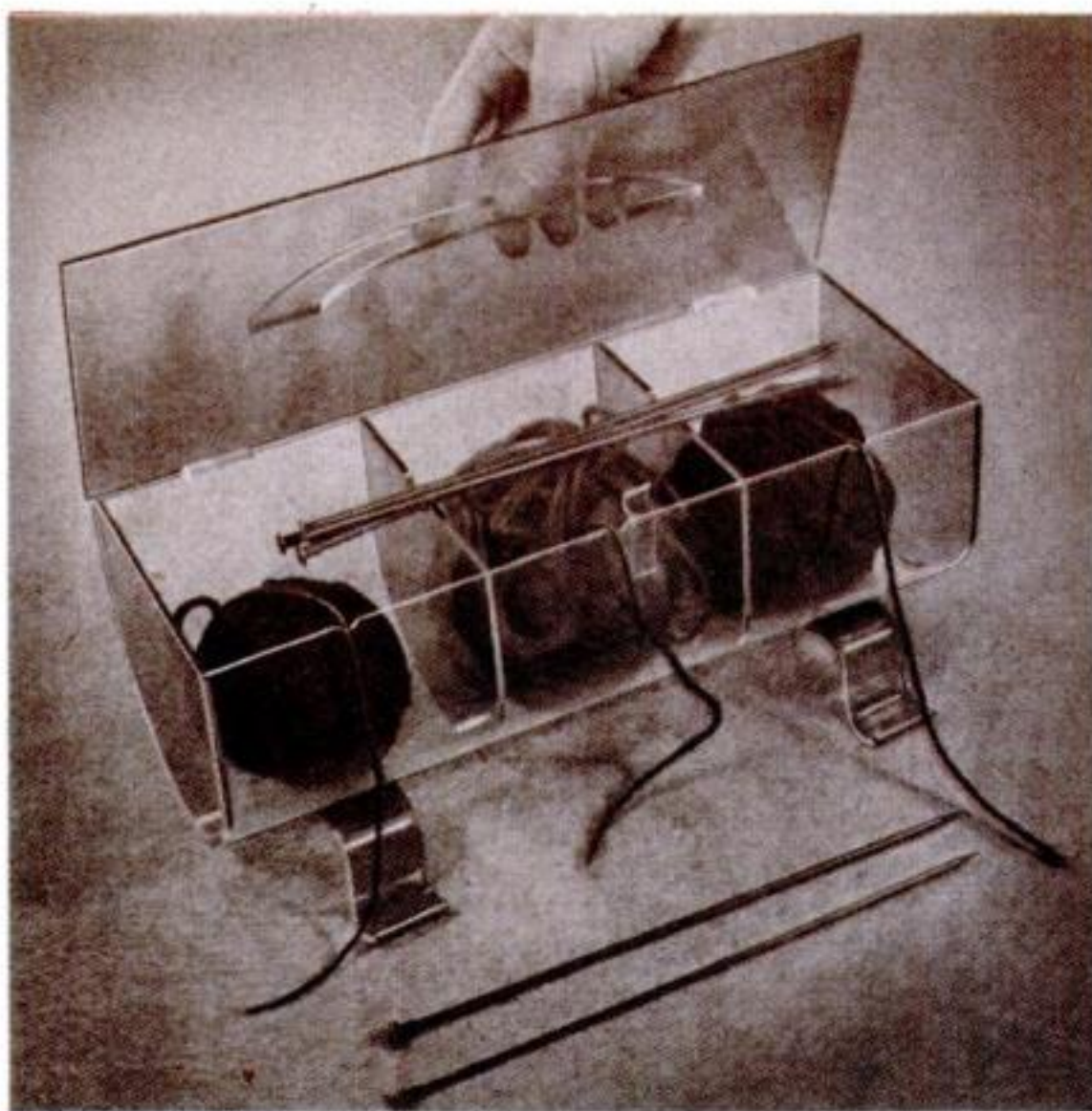
To wire the lamp, split enough cord to reach from under the base to the socket. Run the wires along corners of the glass case.—Arthur Miller, Manhattan, N. Y.



After splitting enough of the lamp cord to run from socket to base, press the wire into the channels in back of the picture frames as in the photo at left. The wired socket is slipped

into place, center. Final step is screwing the $\frac{3}{4}$ " by 4" metal strips to the base. In the drawing, note rubber-headed tacks as legs. These raise base for cord and protect table top.

Plastic Knitting Kit Keeps Yarns Separate



By Roland Cueva

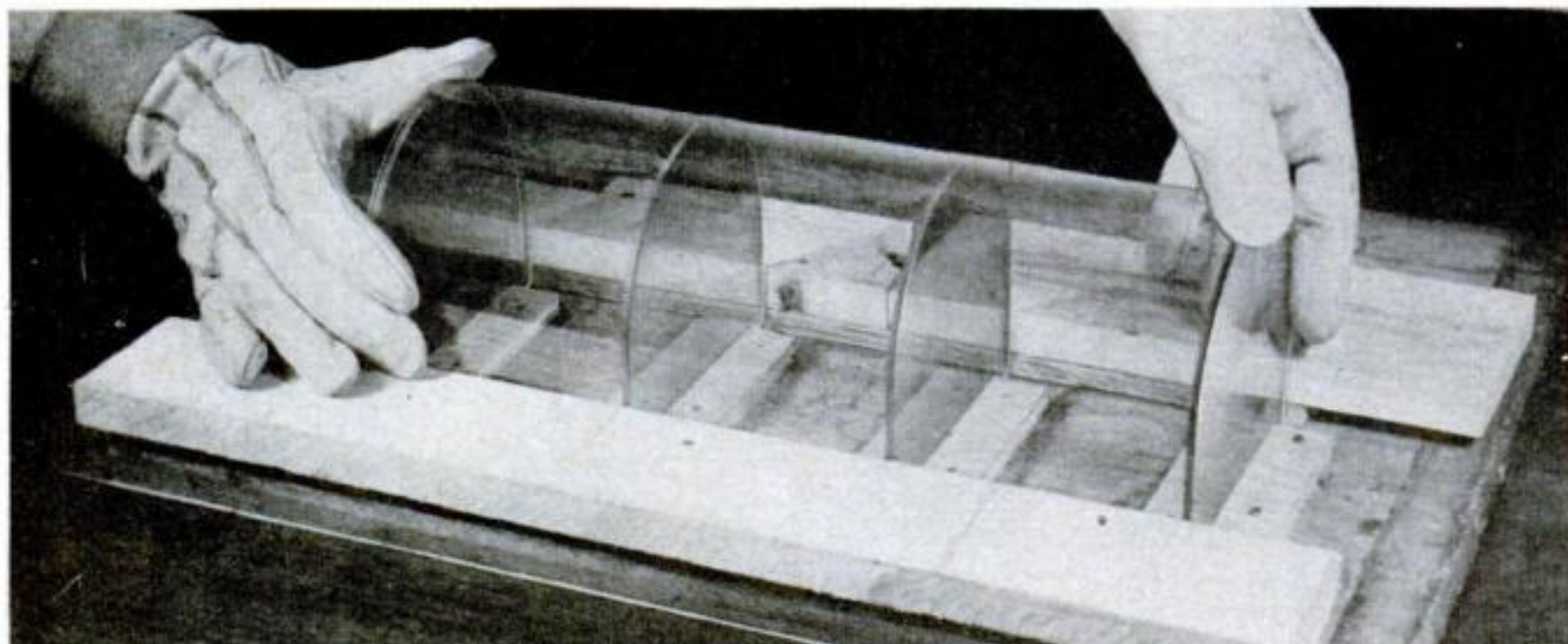
UTILITY plus the gleam of polished plastic combine in this three-compartment knitting kit that also stores a half-dozen needles. A notch in the front wall of each compartment feeds the yarn out smoothly with the lid closed. The handle makes for easy carrying and a plastic catch holds the lid shut.

Use acrylic plastics—either clear, tinted, or a combination. I achieved a colorful effect in the kit I built by making the top, partitions, and legs of transparent amber and the other parts of clear plastic.

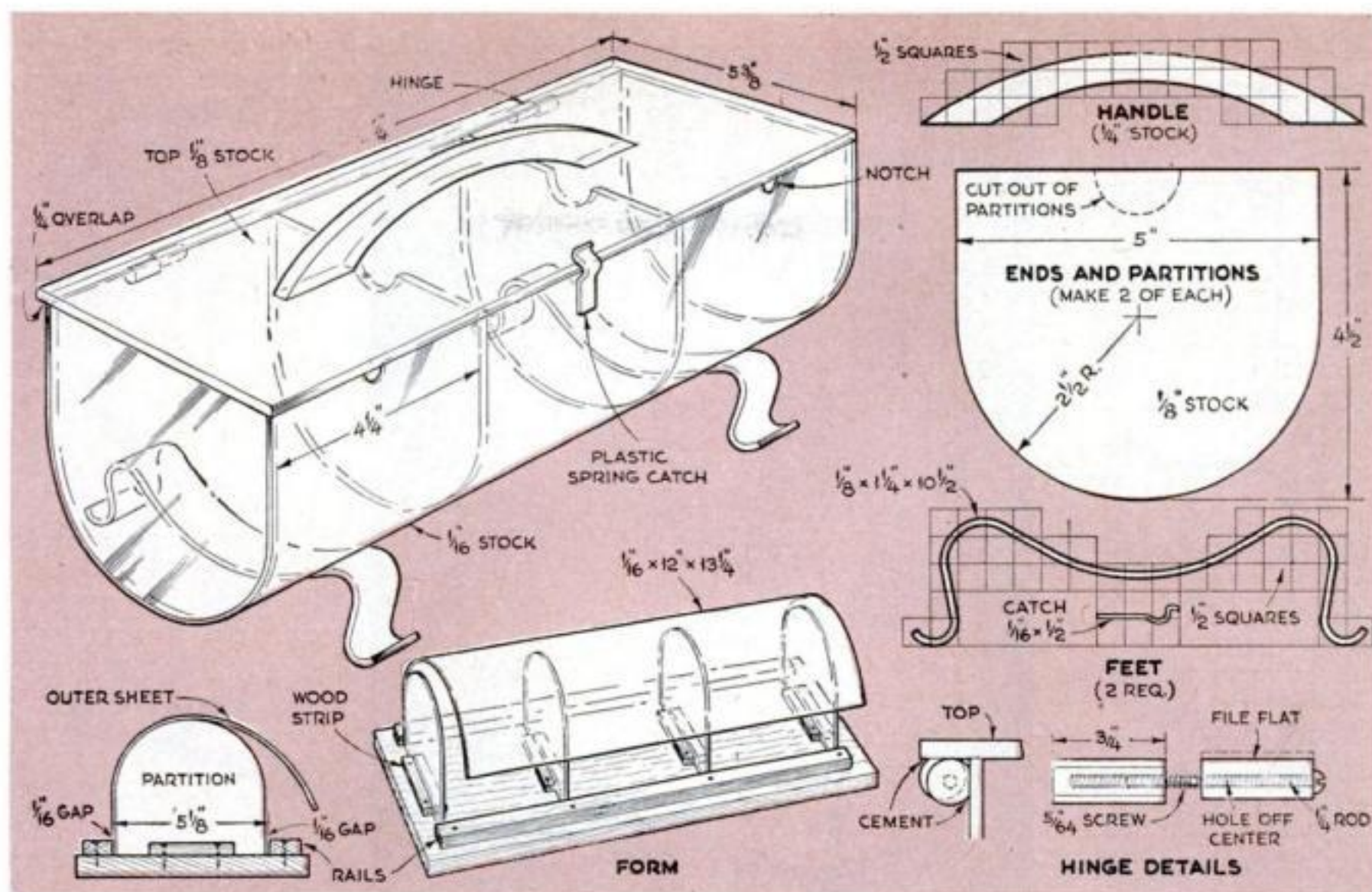
Following the plans on the opposite page,

cut out the parts. Draw the outlines on the masking paper, leaving the paper on the plastic while sawing it. Use a fine-tooth saw for the major cuts and a coping saw for the needle notches in the partitions and yarn notches in the front.

Edge polish all the pieces before assembly. Smooth them with a medium-fine file. Then sand the edges with wet No. 7/0 garnet paper. Get the edges of the ends and partitions square so they'll make a good bond to the 1/16" sheet that forms the outside. Continue sanding until all file marks are gone. As the last step, rub the edges



Form is made of strips of wood to hold ends and partitions while heated 1/16" sheet is bent.



All the parts, detailed above, are held by plastic cement. No other fastening is required.

with powdered pumice and water until they shine. You can also buy a commercial compound for this step.

Mount the ends and partitions on the form as shown in the photo. Put the 1/16" sheet in the oven on a piece of asbestos or on a cake tin and heat until pliable. This requires several minutes at about 250 degrees. Using gloves, remove the sheet from the oven and quickly lay it over the partitions and ends. Bend it evenly around them and down into the spaces along the rails. Hold the sheet firmly with both hands until the

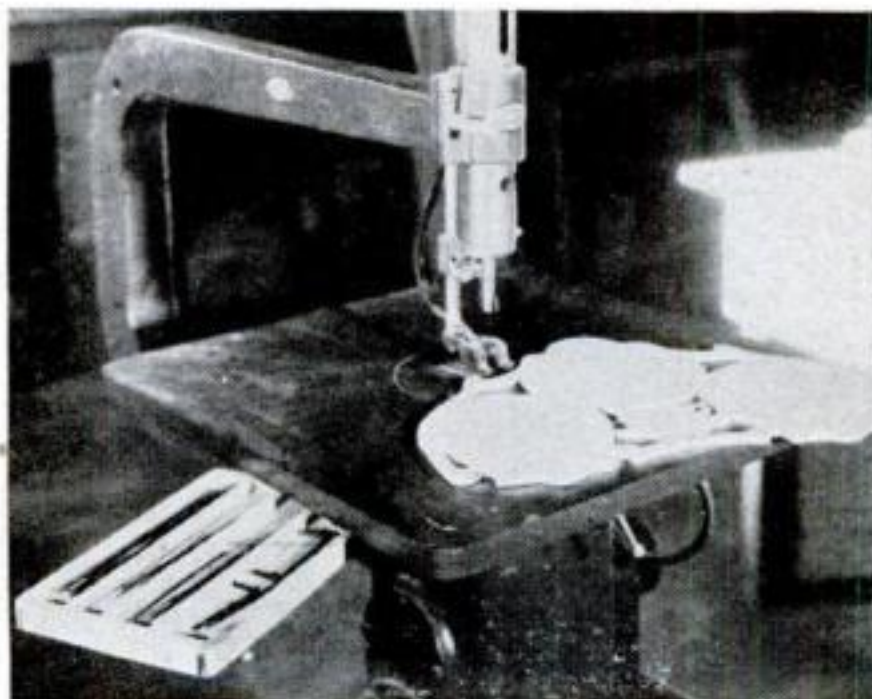
plastic has set in its new shape. The legs may be shaped by hand or over a simple form.

Hinges are made of 1/4" plastic rod, drilled for screws as shown. File them flat on one side and cement them to the overhang of the lid and to the back of the kit. The screws are inserted before cementing. Heat the catch and bend it with pliers. Cement it to the front with the lid closed for a good fit. Outward pressure on the catch releases it.

Assemble with plastic cement and clamp the parts until the cement has set.

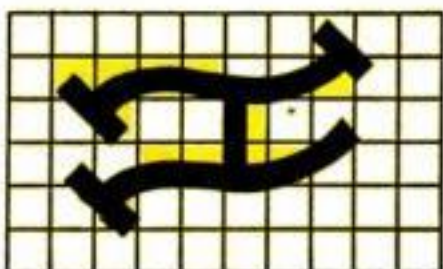
Drawer for Jigsaw Blades Swings Out of Way

THERE is plenty of space under the table of a jigsaw for a drawer to hold blades and Allen wrenches. The one I made pivots on a flathead, countersunk machine bolt and has a knob on the other end for swinging the drawer out. Made of 3/8" stock, the inside dimensions are 3" by 4 1/2" by 9". It has four sections and is assembled with glue and brads. In the pivot corner, there's a 3/8" block with a hole drilled through it and the drawer bottom for the bolt. Locate the drawer so it will swing in and out under the table without interfering with the saw's operation.—*Dick Hutchinson, El Monte, Calif.*





Rancho El Niguel, 1833
(Juan Avila)



Rancho Santiago de Santa Ana, 1844
(Ramon Yorba)



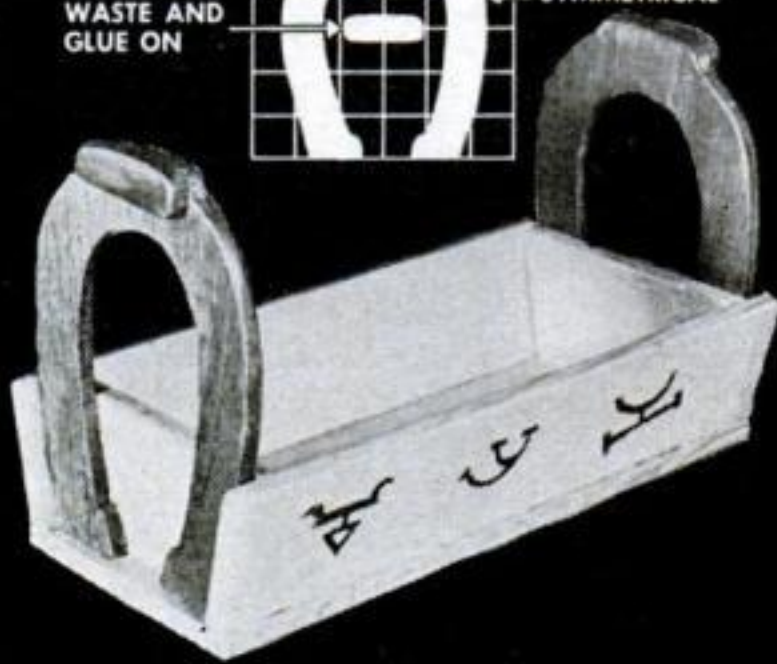
Rancho La Ballona, 1844
(Augustin Machado)

Western Style Barbecue Tray

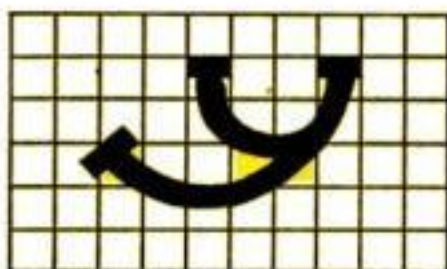
1" SQUARES→

CUT OUT OF
WASTE AND
GLUE ON

SIDES NOT
SYMMETRICAL



Rancho Santiago de Santa Ana, 1844
(Bernardo Yorba)



Rancho Camulos, 1850
(Ygnacio del Valle)



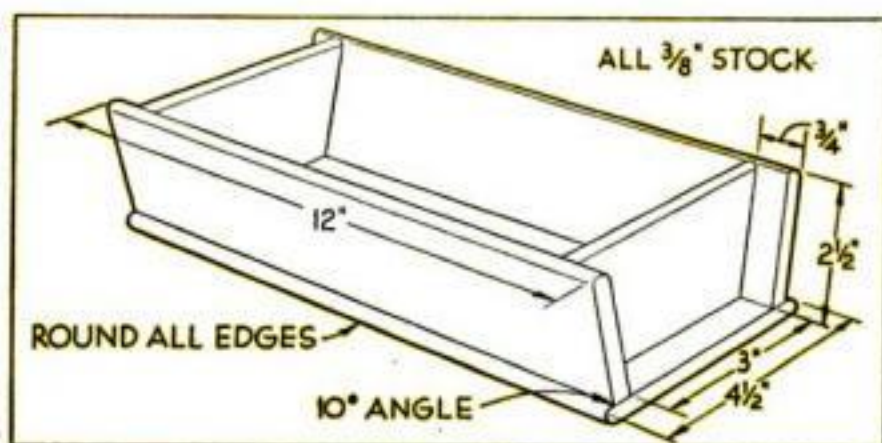
Rancho Los Verdugos, 1836
(Maria Verdugos)

BRANDING-IRON designs and horseshoe handles lend an air of the Old West to this snack or barbecue tray. It's made of $\frac{3}{8}$ " white pine, providing plenty of contrast with the burned-in ranch brands. Using $\frac{1}{4}$ " squares, trace the brands three to a side and burn them in with an electric pencil, small

soldering iron, or heated nail held with pliers. The horseshoe handles are laid out on $\frac{3}{8}$ " stock with 1" squares. Cut the toe calks of $\frac{3}{8}$ " pine and glue them to the shoes.

Each of the designs pictured above is a copy of an early California ranch brand. Beneath each is the ranch name, the date the brand was registered, and the owner's name. For reference, that information may be burned into the bottom of the tray.

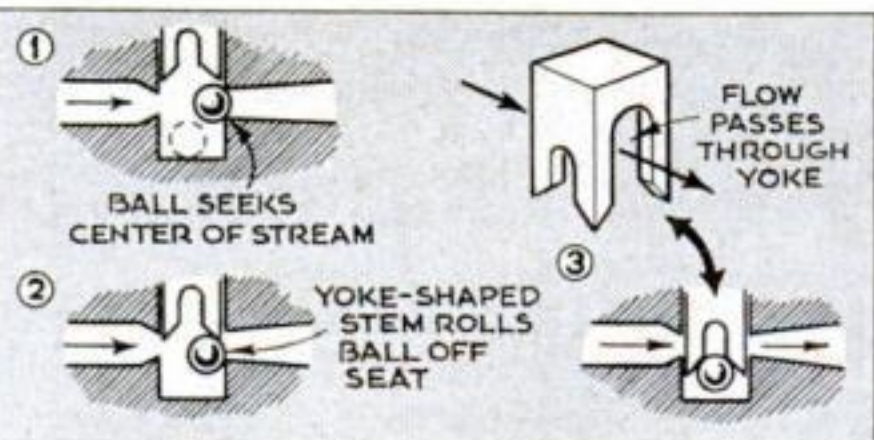
After burning in the designs, assemble the tray with glue and brads. Sand it smooth and round all edges. The shoes are stained brown and attached to the tray with glue and brads. Finish the tray with two coats of clear shellac, sanding lightly between each coat.—Whitney K. Towers, Los Angeles.



Springless Valve Controls Powerful Air Blast

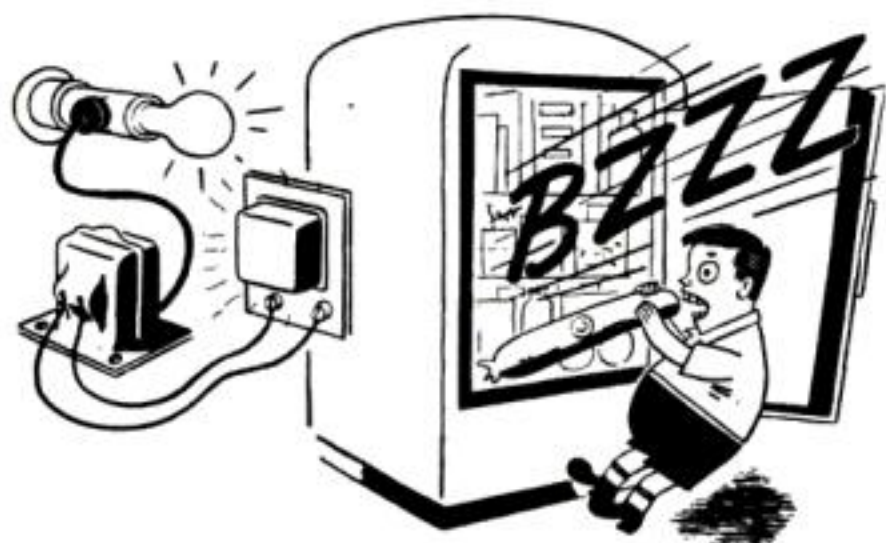


PACKLESS and springless, this general-purpose air valve opens with very little thumb pressure and instantly snaps shut when the plunger is released. It's made by Paul Valve



Corp., New York City, for $\frac{1}{8}$ " or $\frac{1}{4}$ " hose and up to 100 lb. per sq. in. pressure. The plunger rolls the ball out of the seat. Pressure pops it back when plunger is released.

What's Your Ingenuity Quotient?



Our little Buster, a confirmed refrigerator raider, would march away with a yard or so of salami over his shoulder and always leave the door open. Now this rig sounds the raid alarm. I hooked up a buzzer and bell transformer, plugging the latter via a side-outlet socket into the interior refrigerator light. It uses current only when the door is open. It scared Buster so badly we couldn't drag him near the box for two days.
—Steve Walton, White Plains, N. Y.



I was driving along the highway when a cotter pin let go, allowing a clevis pin in the accelerator linkage to drop into the splash pan. The problem then was to get down into the narrow space between the engine and fender to retrieve the pin. I couldn't reach it with my hand so I disconnected the windshield-wiper hose, started the engine, and used the hose as a vacuum cleaner to pick up the pin.—John L. Rondeau, San Fernando, Calif.



There was no valve to stop the water that was pouring from a storage-tank delivery pipe, and my wife kept saying I'd better do something about it. "Don't worry," I told her, "it's in the bag." So I put a bottle of soda pop, neck down, in a small cloth bag. Then I tied a line to the bag and lowered the whole business into the tank. The neck of the bottle entered the outlet pipe, cutting off the flow enough so I could make the repair. Then I drank the pop.—Robert Carabin, San Antonio, Tex.



Our dog, Butch, had insomnia. This made him very irritable. We tried everything and finally decided he needed an inner-spring mattress. I couldn't find such a mattress to fit his kennel. Then I hit on this. I put an old 600 by 16 inner tube inside a feed sack, closed the neck of the sack, and pumped up the tube until it stretched the sack drum-tight. Now Butch has a good sleep every night.—Clarence Waas, Winchester, Ky.

Have you pulled off a smart one lately? We will pay for acceptable contributions showing ingenious solutions of problems in the home, shop, garage, or camp. It doesn't matter if it's wacky—if it works. Use government postcards only. Contributions cannot be acknowledged or returned.

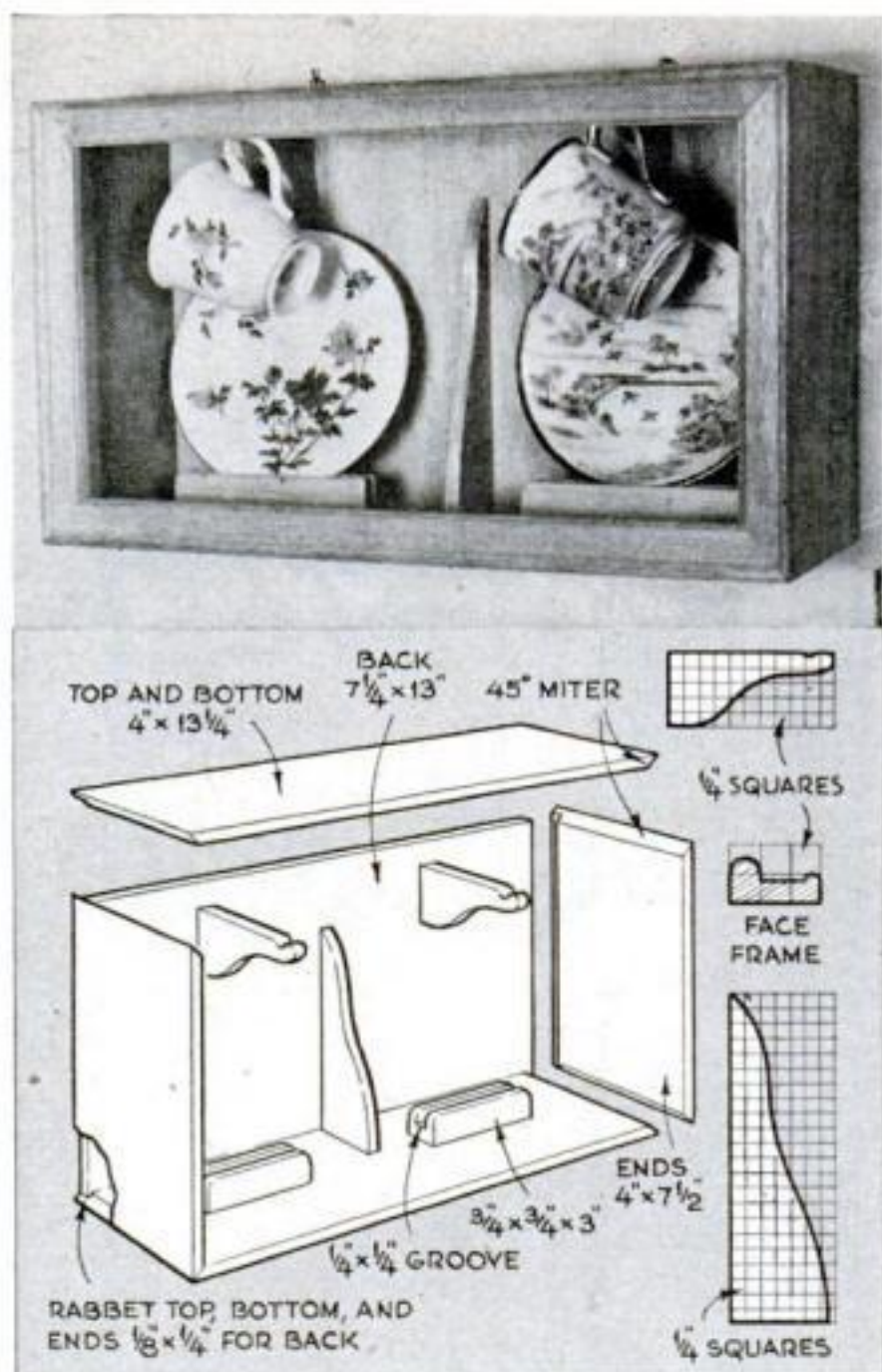
Shadow Box Shows Off China

FOR fine pieces of china, a shadow box is needed to show them off to best advantage. This one was built of $\frac{1}{4}$ " mahogany plywood, with the face frame of solid stock.

Cut the top, bottom, and ends 4" wide and to the lengths shown in the drawing. Then rabbet the back edges $\frac{1}{8}$ " by $\frac{1}{4}$ " to receive the $7\frac{1}{4}$ " by 13" back. After mitering the top, bottom, and ends, glue them and the back in place. By gluing the back in at the same time as the other pieces, you'll have no trouble in squaring the box.

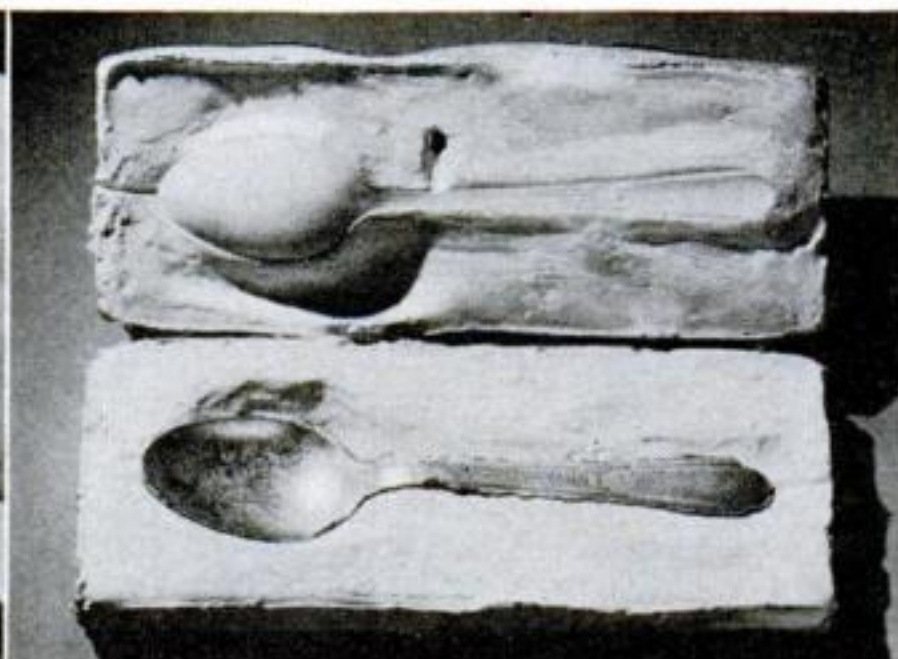
Follow the pattern given for the narrow face molding, or shape it to suit yourself. This may be bradded to the front of the box, but for a real professional-looking job, glue it in place.

After laying out and sawing the cup hooks and divider to shape, sand them smooth. They are fastened from the back with small screws. Dado the grooves in the saucer holders, or saw and chisel them out. Those pieces are held by screws through the bottom. Finish the interior of the box before screwing in those parts.—*Whitney K. Towers, Los Angeles.*



Finished showcase for pair of cups and saucers was cut and built from $\frac{1}{4}$ " mahogany plywood.

Homemade Trick Spoon Will Vanish in Hot Tea



THIS might be called the Case of The Disappearing Spoon or, Who Put Wood's Metal in Aunt Minnie's Tea? Here's how you make a spoon that acts like the one in the photo: Pour 1" of plaster of Paris in a 2" deep box. When it's like putty, coat a spoon with salad oil and press it into the mix but don't submerge it. When hard, oil the surface and fill the box with plaster. Later you can lift the top off the mold. Cut

a pouring hole in the top and a vent at one end. Pour in molten Wood's metal, which melts at 160 deg. F. and can be bought at a chemical supply house. Polish the trick spoon with fine steel wool. (A power buffing wheel would melt it.) Now slip it into the saucer of someone's teacup and watch the general surprise when the spoon melts. Don't let anyone drink the tea. The metal can be recast.—*J. W. Carr, Bellmore, N. Y.*

Speedy Kayak Built in Jig

By Hi Sibley

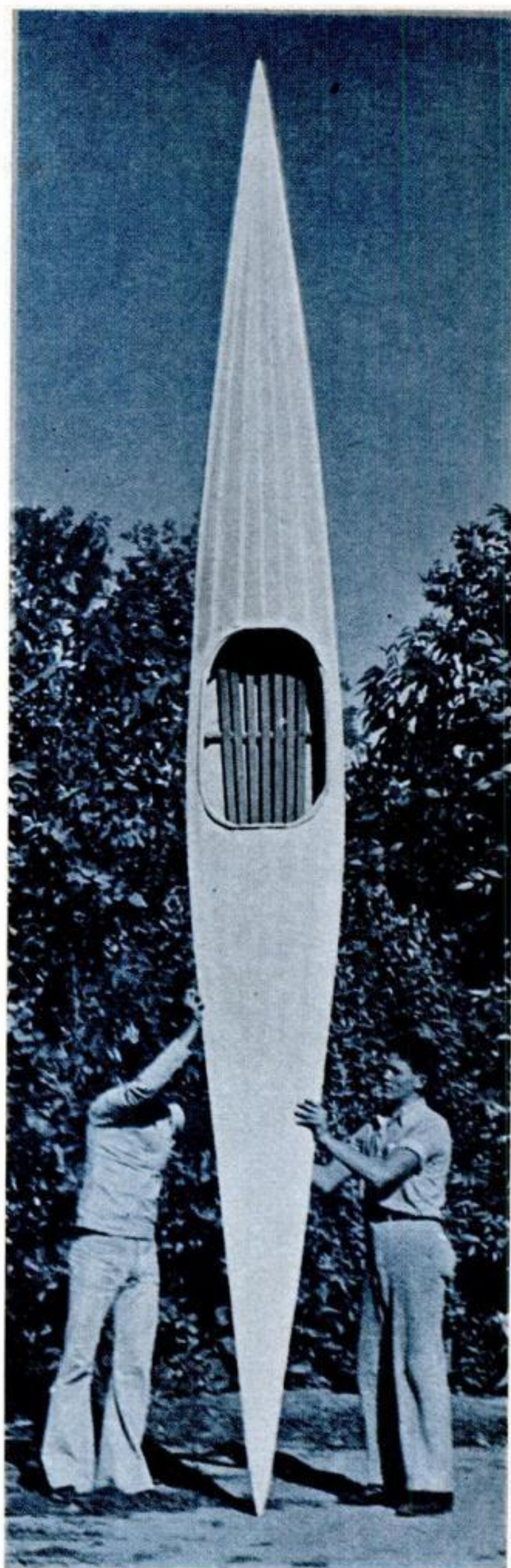
WHEN your girl paddles around in this boat, it's an umiak—not a kayak. It may sound like double talk, but the Eskimos who originated this type of craft call a man's boat a kayak and a woman's an umiak. The one shown here is designed primarily for speed but it handles safely in fairly rough water because of its length and the high coaming.

The frames are $\frac{1}{2}$ " marine plywood and the battens are spruce. The whole business is covered with 8 oz. duck, making a light, strong boat. For ease in building, the framework is assembled upside down on a jig. The jig is a 2" by 8" plank supported on up-rights, Fig. 1 on the next page. Notch the plank for the frames and cut it at the ends for the stems. To get the plank out of the frames, saw it in two. Note in Fig. 2, the deck plan and outboard profile, that all frames are spaced equally.

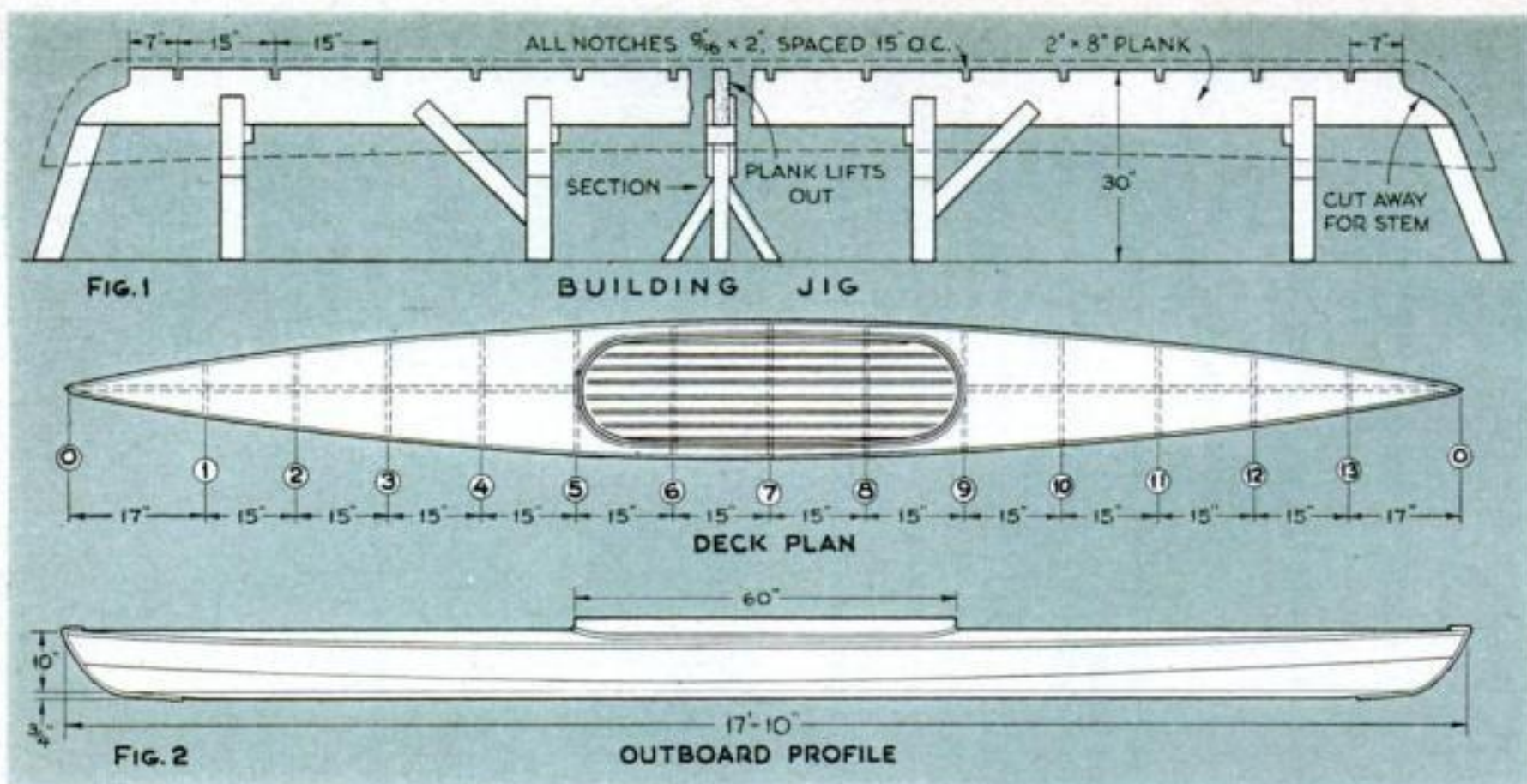
First step is to saw out the frames to the dimensions given in Fig. 3. Lay out the work on a plywood panel, checking before you cut to be sure waste is minimized. The deck beams, also shown in Fig. 3, are $\frac{1}{2}$ " by 1 $\frac{1}{2}$ " pine cut on a 40" radius.

Make the stems of pine for lightness. The stem profile in Fig. 4 shows the locations of the notches for the battens and keelson. Cut back the stems for the keelson and bevel the front edges as indicated.

Drill holes in the stems to screw them to the jig during construction. With these and



Clean lines and exceptional length are two outstanding features of this fast, sturdy kayak.

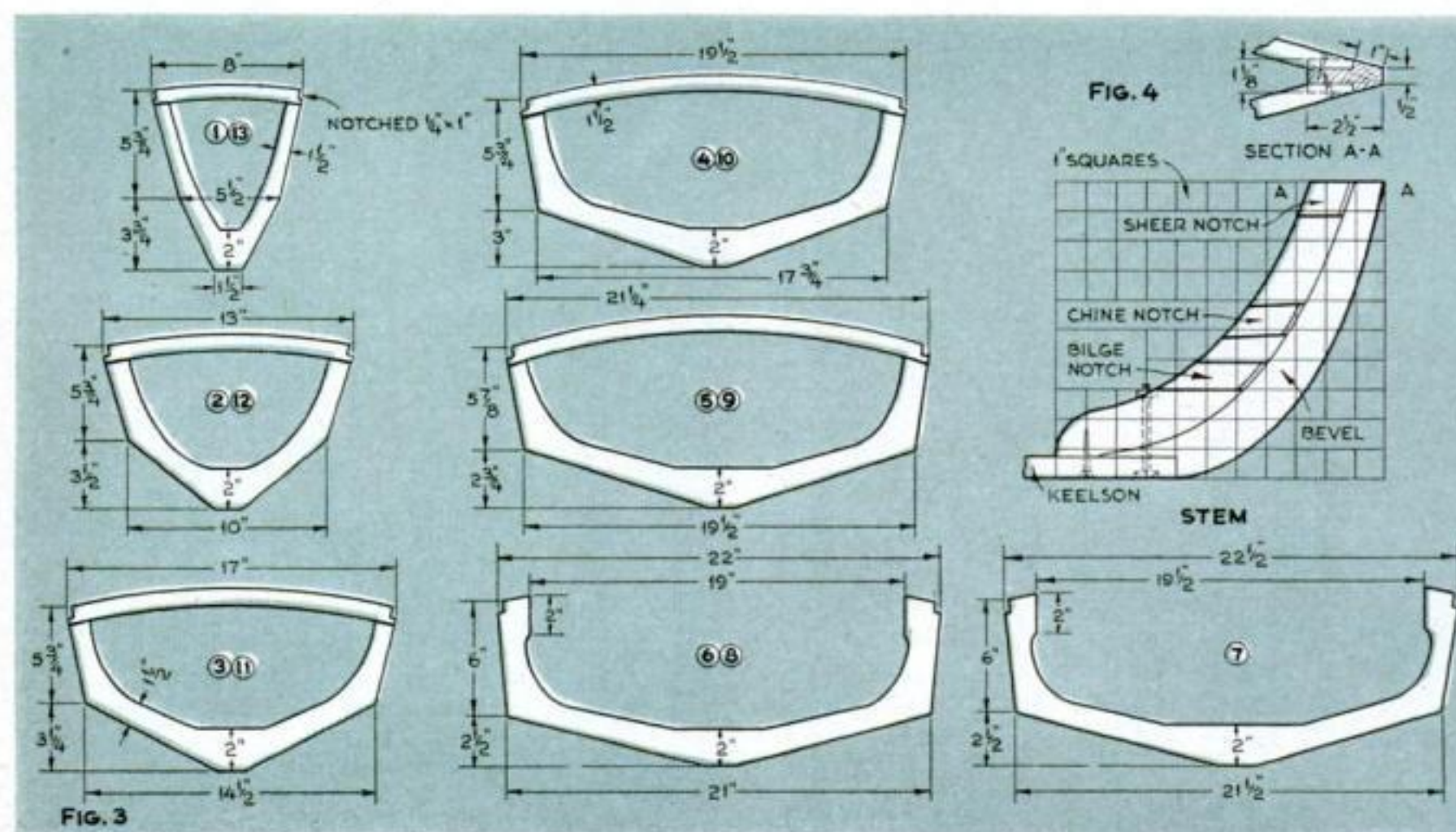


Use of jig simplifies building by holding frames in place until they are joined to battens.

all the frames in place, the keelson can be installed. Put a screw through the keelson into each frame. Locate them off center to make way for the screws to hold the keel. It is put on last, over the canvas. Next put on the sheer battens. Begin at Frame No. 7 and work toward the ends, alternating from side to side of the kayak with the screws. Follow with the chine and bilge battens.

At this point take the boat out of the jig and turn it right side up to complete the deck beams and cockpit. A general view of

assembly is shown in Fig. 5. Deck beams are fastened to the frames with a screw at each end. Note that Frames No. 6, 7, and 8 are left open with a sub-coaming extending from No. 6 to 8 on each side. Filler boards complete the rounded portions between Frames No. 5 and 6, and 8 and 9. One filler board is shown in greater detail in Fig. 6. Put in the sub-coaming but leave the true coaming until after you've put on the canvas. Screw the $\frac{3}{8}$ " by $\frac{1}{2}$ " tacking strip in place as in Fig. 8. The flooring is $\frac{3}{8}$ " by $1\frac{3}{4}$ " stock.



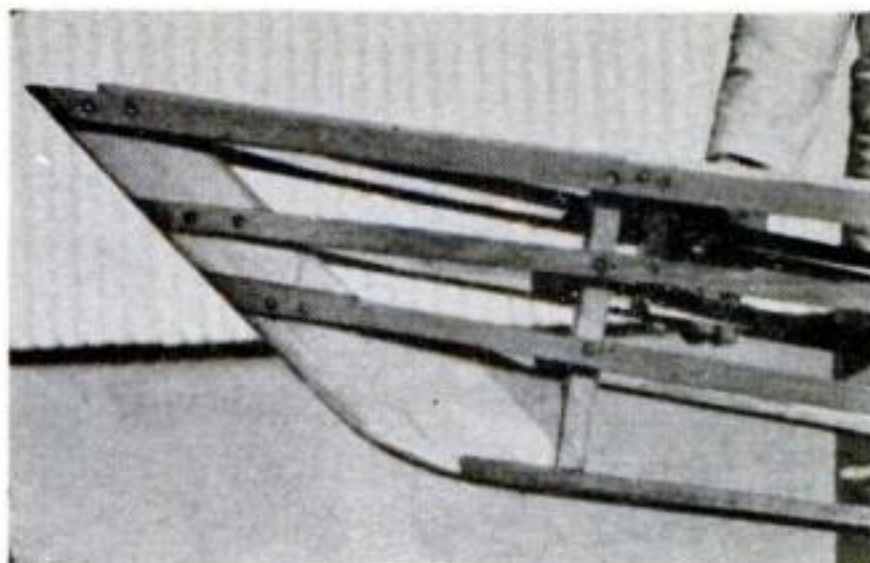
Deck beams bridging frames are $\frac{1}{2}$ " by $1\frac{1}{2}$ " pine cut on 40" radius. Frames are plywood.

After screwing on the longitudinal deck battens, you're ready to put on the hull canvas. You'll need a piece 1 yd. wide and 6 yd. long. Lay it over the frame and tack it in three places along the keelson. Next draw it over the chines and tack it temporarily on the sheer battens amidship. Wet the canvas and pull it lengthwise over the stems and again tack it temporarily there.

As the canvas dries it will shrink and take the shape of the framework. When it's dry, remove tacks and canvas. Apply marine glue along the bottom of the keelson and on the bevels of the stems. Replace the canvas, putting in tacks about $\frac{3}{4}$ " apart. Then draw the duck up over the chines and on over the tops of the sheer battens and tack it there. The marine glue should be applied just before you tack on the canvas. Figure 7 shows how the duck is lapped on the stems and later covered with a brass strip.

Next comes the deck canvas. For this you need a piece 2' wide and 6 yd. long. Lap the deck canvas over the hull canvas and tack it in place. Cover the entire top of the kayak, including the cockpit. Wet the canvas and put weights on it over the cockpit opening. This will take up any slack.

Leave the weights in overnight. When the canvas is dry and with the weights still in place, tack it all around the top of the sub-coaming and on the curved tacking strips. Then with a razor blade or sharp knife, cut away the duck over the cockpit.

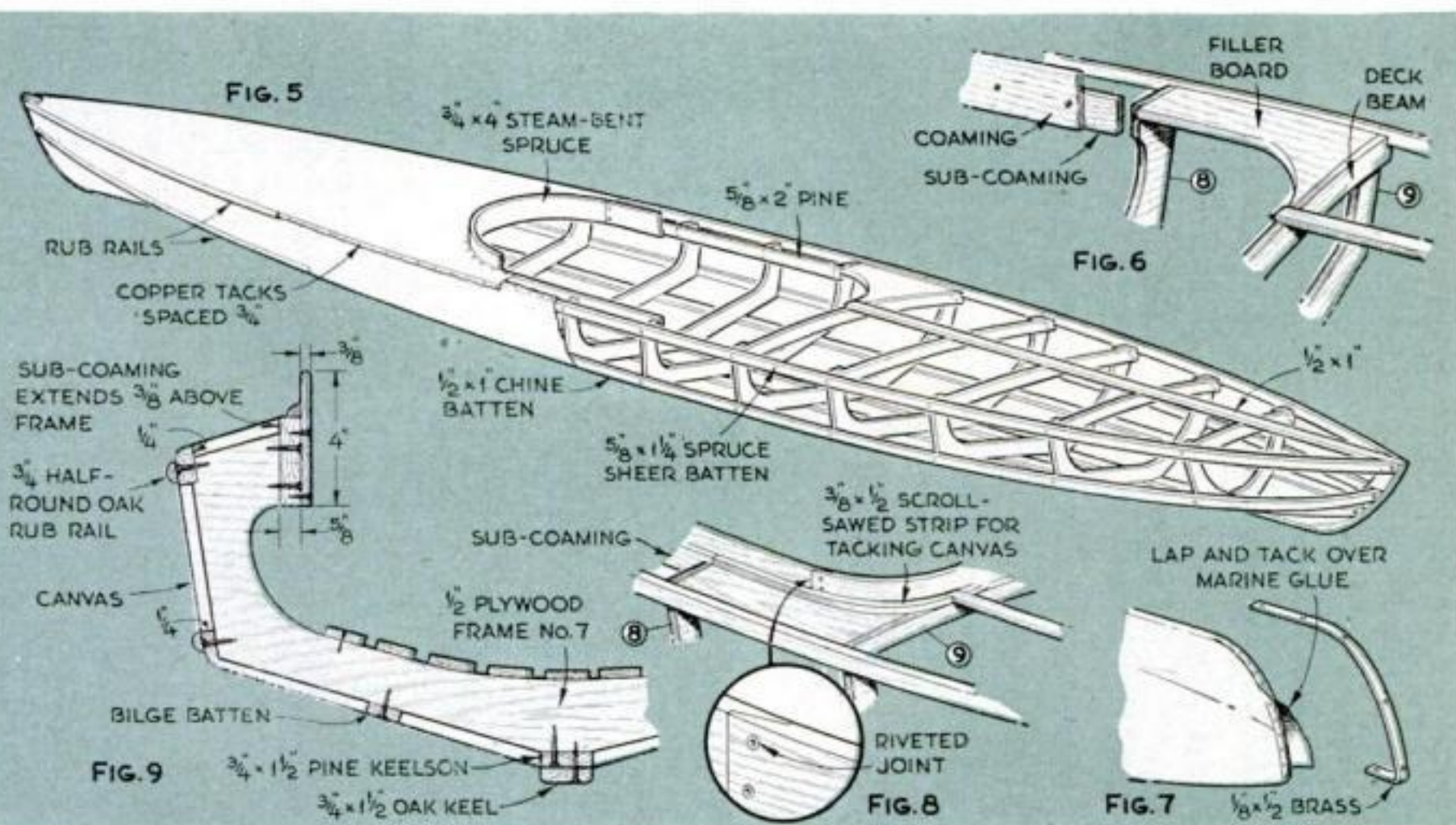


Here is one end of framework. Note how battens are faired into the notches cut in the stem.

Installation of the true coaming is next. Make the lap for the riveted joint as shown in Fig. 8. Steam $\frac{3}{4}$ " by 4" by 48" pieces of spruce. Bend them around a form with an 8" radius. Apply marine glue and screw the pieces to the sub-coaming. Then screw quarter-round molding over the tack heads all around the cockpit.

Apply a coat of canvas cement over the entire skin. When dry, sand it lightly and finish with a coat of deck paint and a flat color. Sand it again and varnish it. Then screw the oak rub rails on the sheer and chine battens. The true keel is put on last as shown in the sectional view, Fig. 9.

In case the canvas isn't as taut as you'd like before painting, you can make it as tight as a drum with airplane dope. Then it needs only one coat of paint and varnish. END



Principal construction details are shown above. Steam-bent coaming is put on after canvas.

How an Expert Cleans a Typewriter

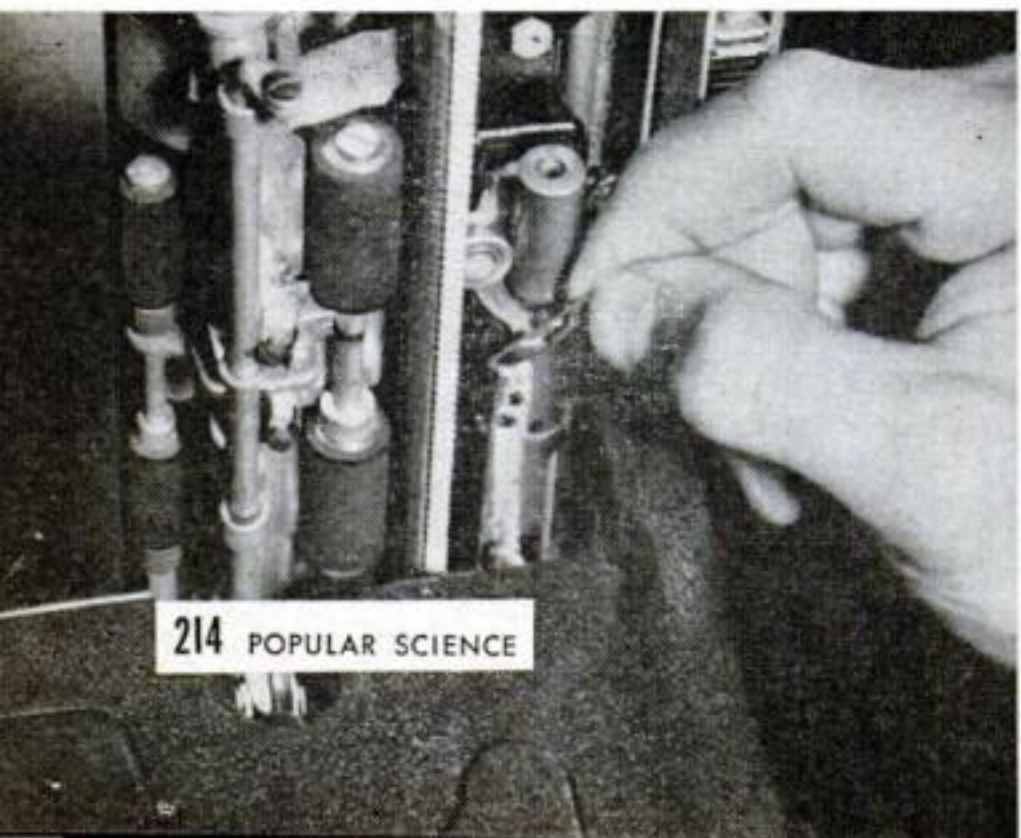
By **Robert Gorman**

PS Photos by W. W. Morris



To keep typewriters working at their peak, Mr. Hoffmann cleans and oils them periodically. The process takes about a half hour and involves the steps shown in the following photos.

1. The drawband—the heavy cloth strip that winds on a drum to pull the carriage from right to left—must be removed from the carriage stud and fastened to a stud on the frame.



FOR some years PS editors have watched quiet, competent Adolph Hoffmann nurse ailing office typewriters back to health. Always anxious to learn how an expert mechanic goes about his work, we recently took a good close look while Mr. Hoffmann cleaned an Underwood Model S.

How expert Mr. Hoffmann is may be judged from the fact that he has been repairing typewriters for 43 years—since the days when rubber bands provided spring action for the early wooden rollers. For 27 years he's had his own repair service.

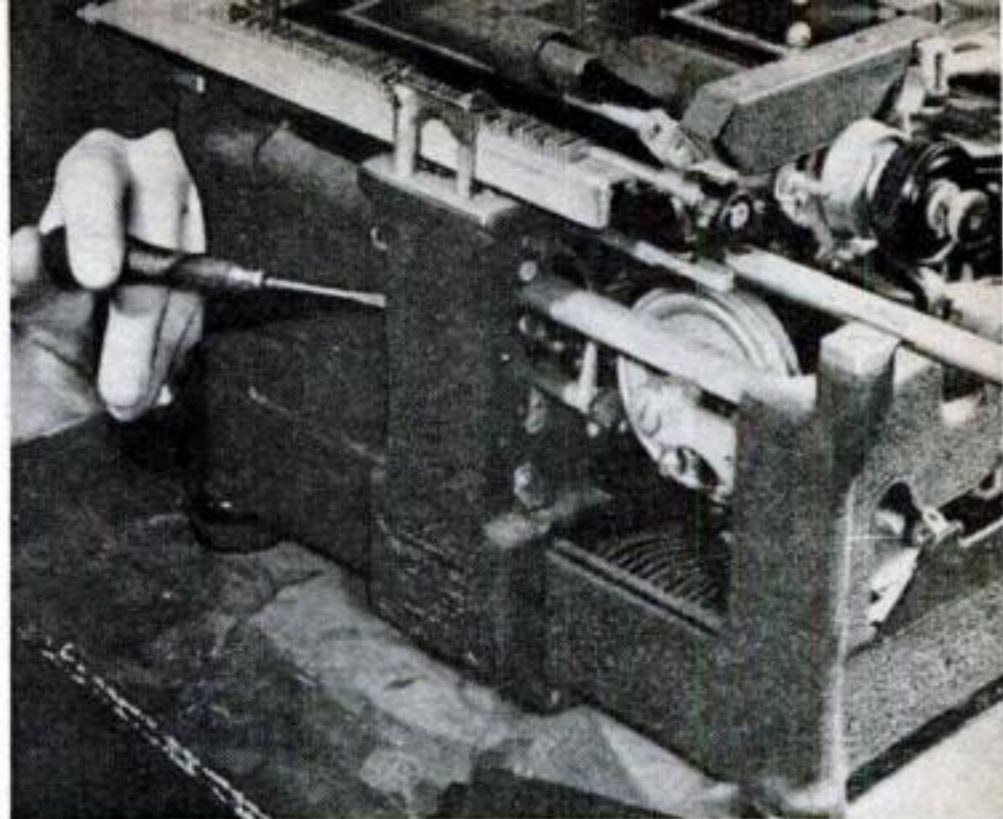
The dust that accumulates when writing machines are left uncovered is one of the biggest causes of sluggish operation. Another bad practice—of which most users are guilty—is that of allowing erasure grit to fall from the page into the type bars and connecting links. Recommended procedure is to push the carriage to one side when erasing. Well up on the list of troublemakers is the all-too-common practice of threading new ribbons incorrectly. This often disengages the automatic ribbon-reverse gears. Before replacing a ribbon, note carefully the direction of rotation of both spools and the position of the ribbon on the vibrator or ribbon carrier.

2. Removing the scale plate comes next. It is fastened by screws at each end. The one at the right also holds the carriage frame stop so it must be removed with special care.

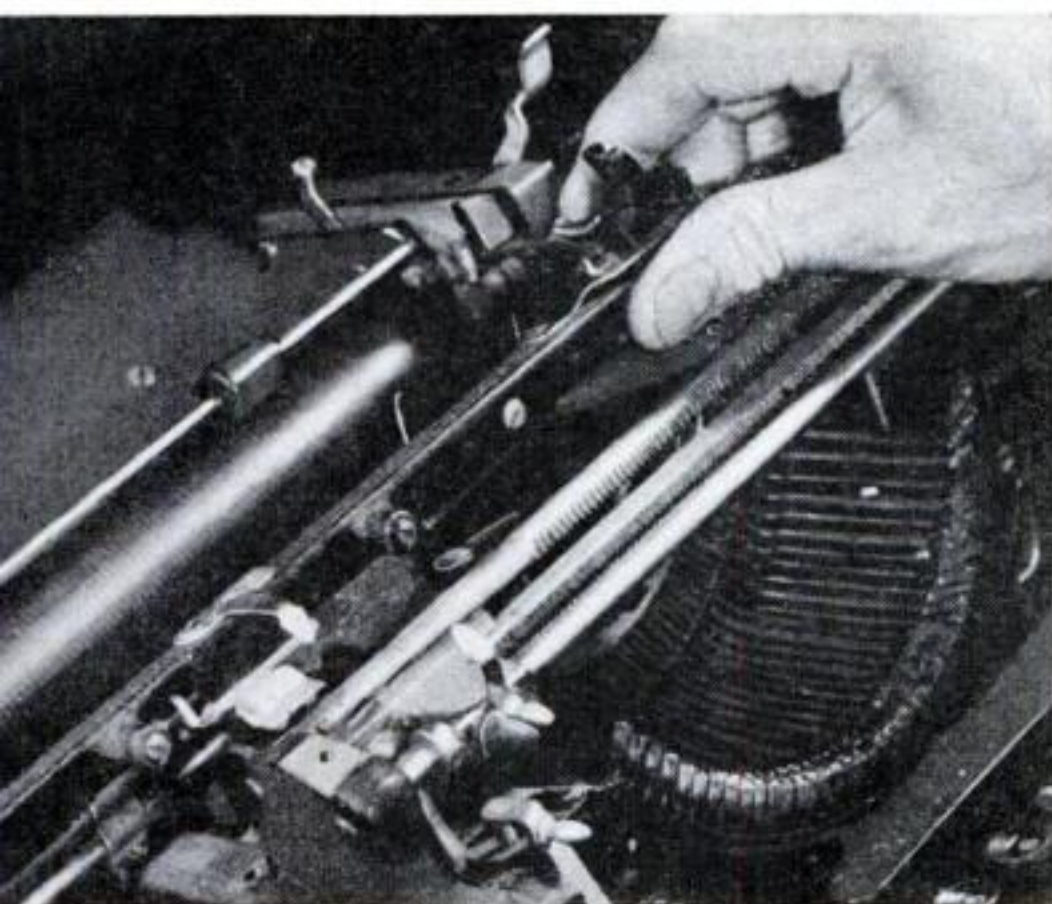




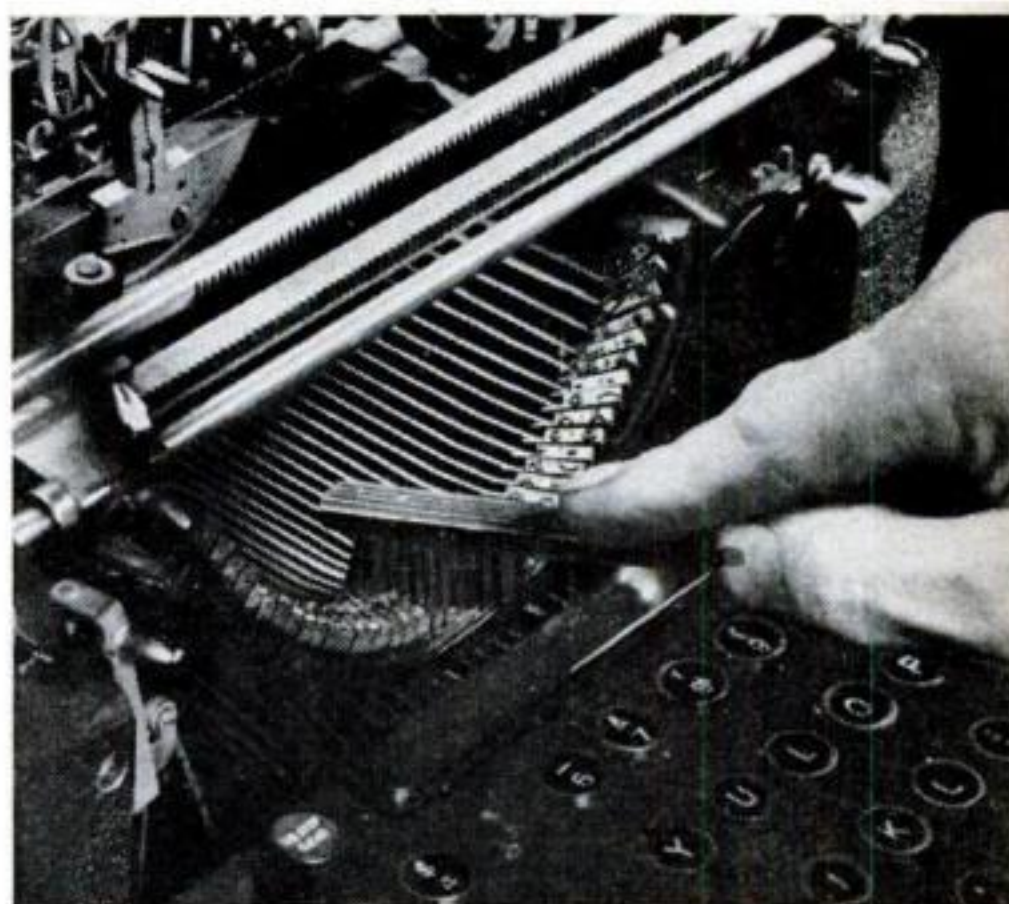
3. Cover plates then come off to make the inside accessible for cleaning. The name plate in front is pried off, being held only by plugs. Side and back plates are held by screws.



4. Taking off the left rear plate exposes the drum on which the drawband winds up. This plate and the one on the right are each held with two screws to the tabulator post.



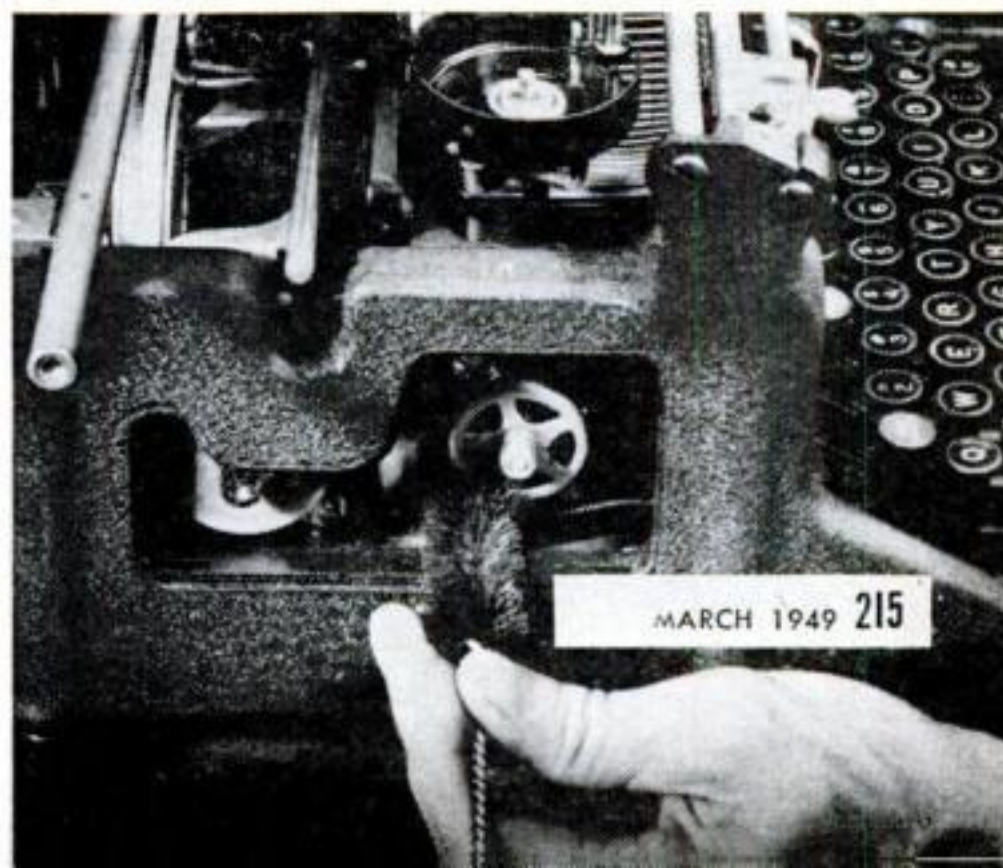
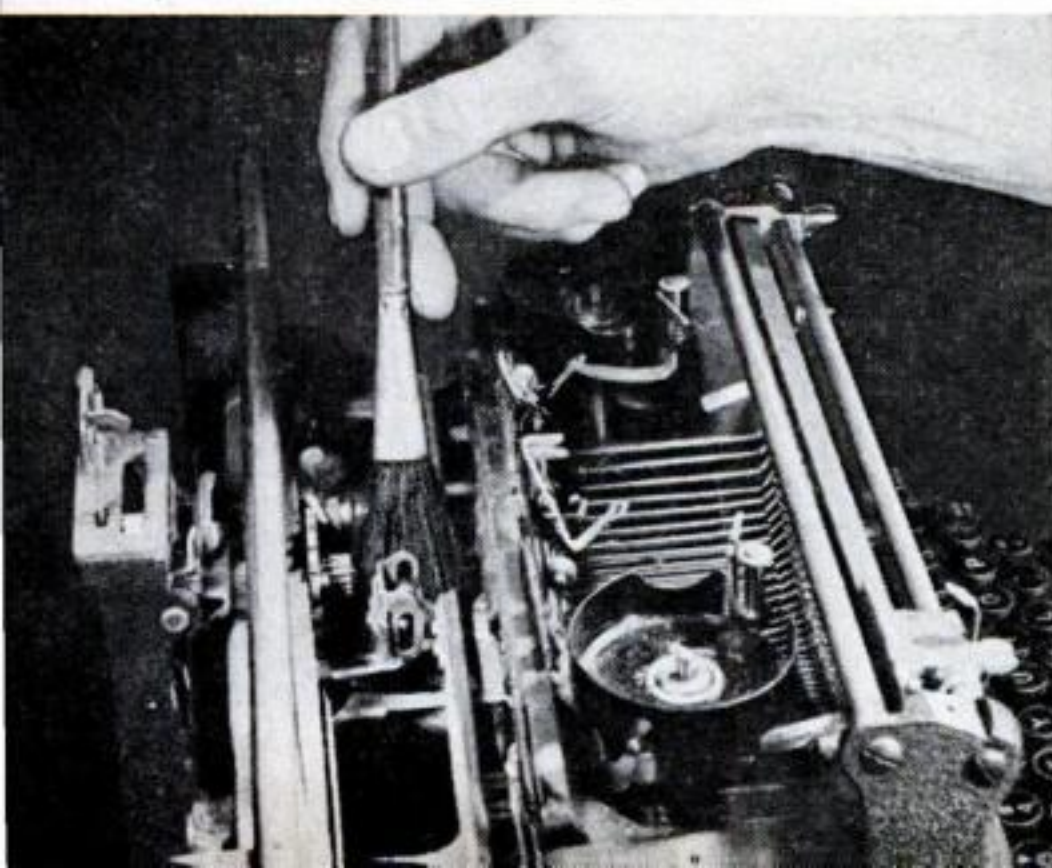
5. Lift the carriage and slide it to the left (on older models, to the right) to remove it. About half way it is tilted down to clear the brake-band guide. No forcing is necessary.

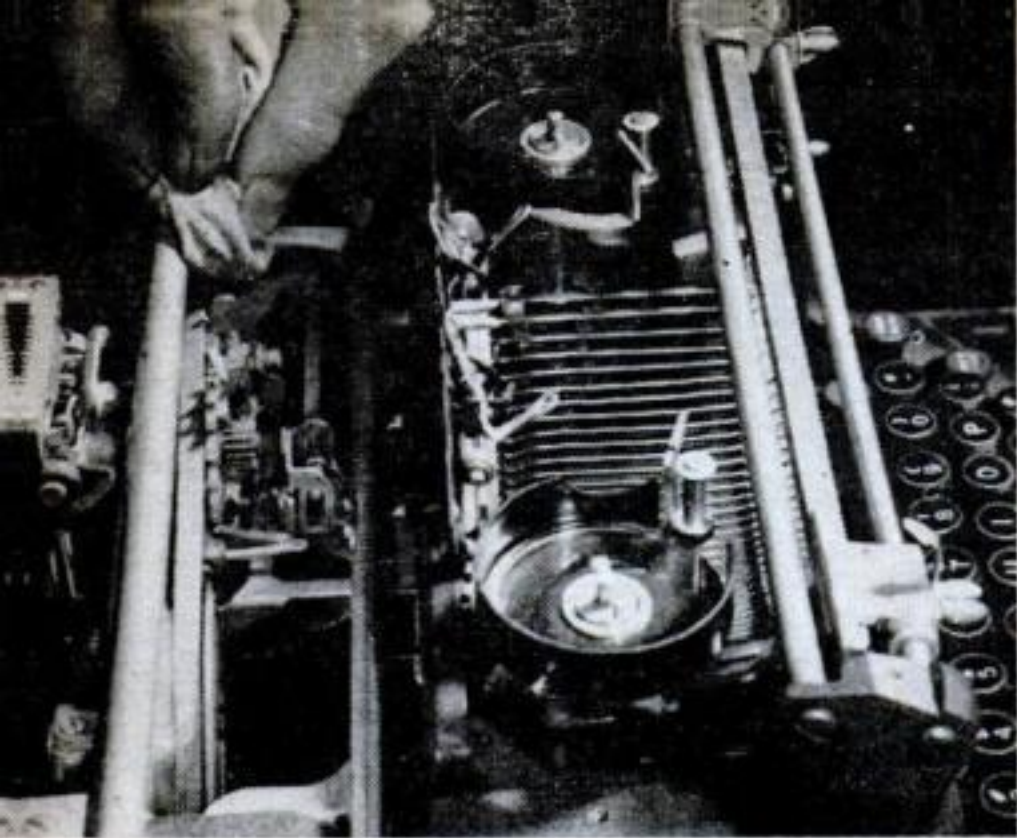


6. With the machine taken down this far, cleaning can begin. Type is brushed forward and back—never sideways. It's important to use good brushes. Loose bristles can cause trouble.

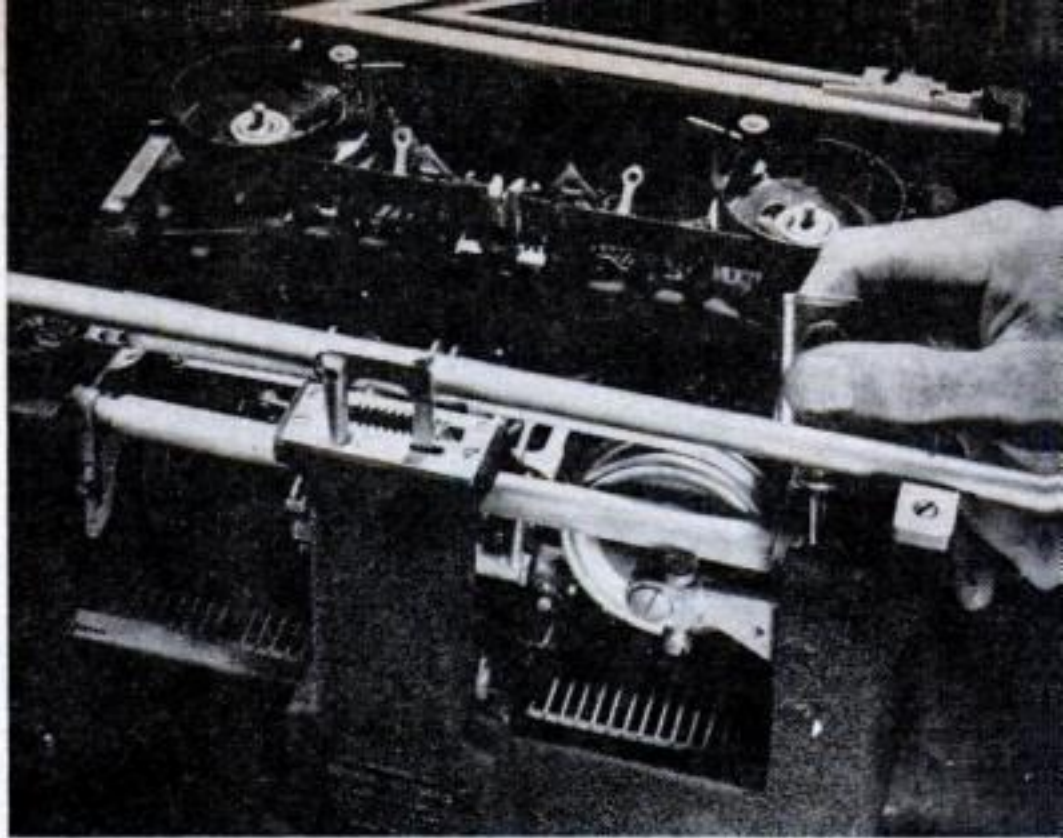
7. Brush the carriage bars and clean them with a cloth moistened in benzine. Use the cloth on the keys, too, in a front and back motion. Benzine doesn't cause gumming.

8. A baby-bottle brush, moved in and out gently from the left side, will get most of the loose dust out of the sublevers. Take it easy with the brush and never force it. ➡





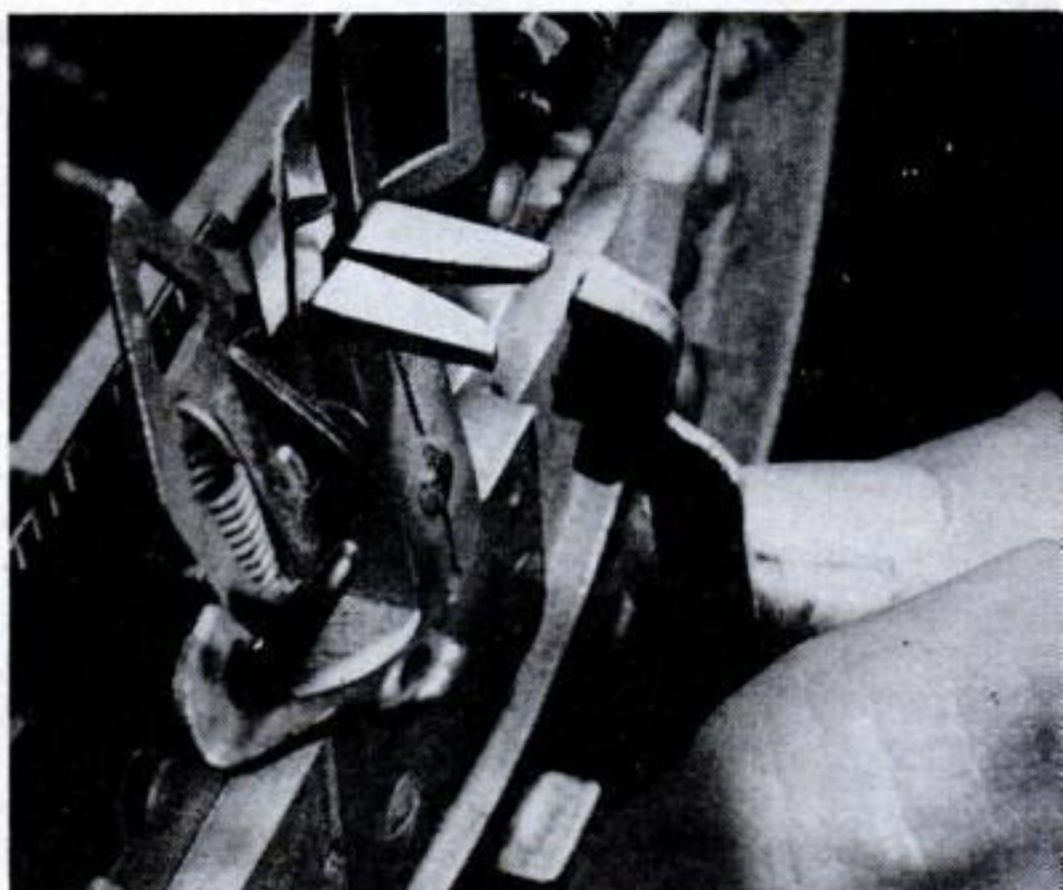
9. **Cleaning the wayrod** with benzine-dipped rag. The two front rails and the lift rail get the same treatment. A mixture of 2 parts benzine to 1 part light oil does a very good job.



10. **Lift-rail pivots** are being oiled. Also oil the universal bar (touching thumb) and other transverse rods. Use typewriter oil or mix 2 parts light machine oil to 1 of kerosene.



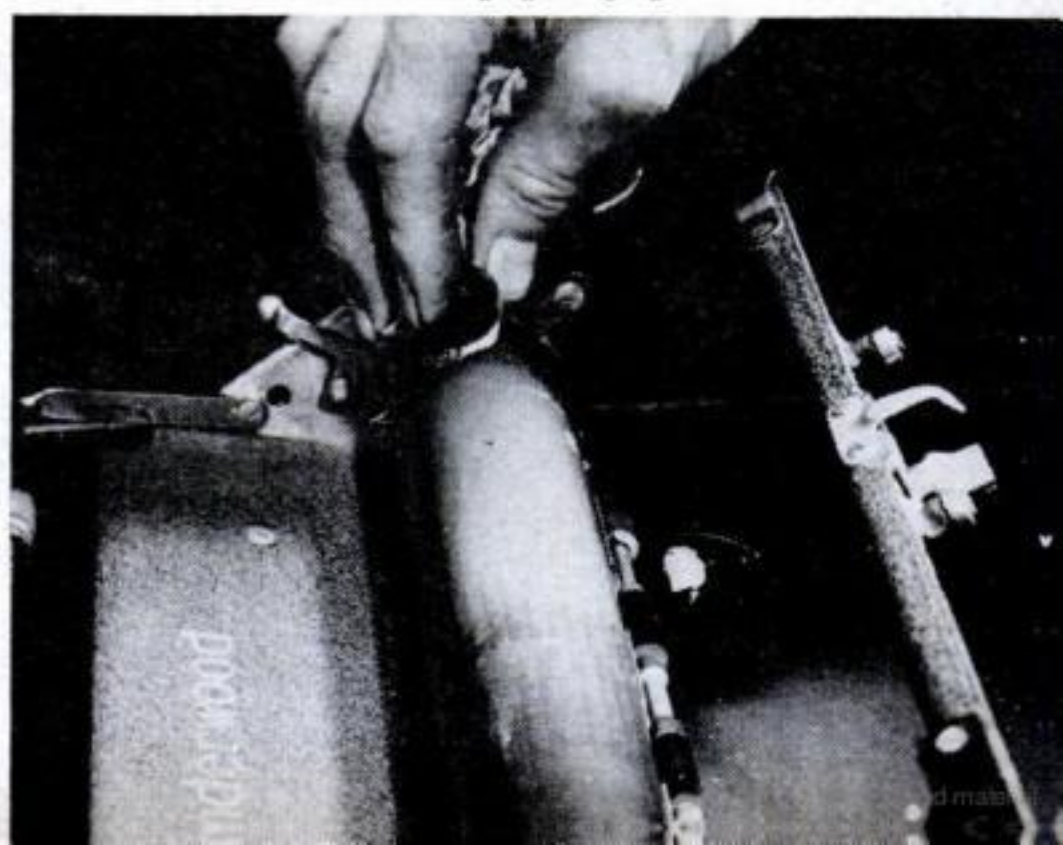
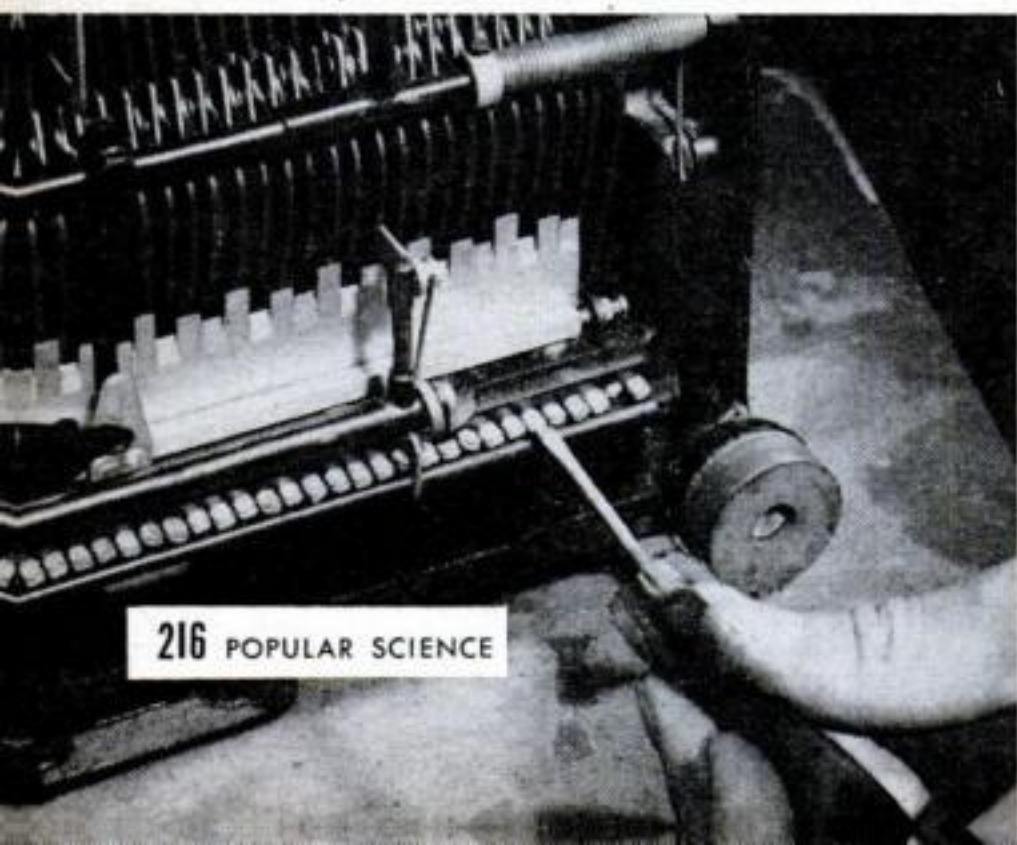
11. **Dust and eraser grit** may be cleaned from the type-segment slots with a special pick, a knife, or a toothpick. Finish by brushing the slots with the benzine and oil mixture.



12. **Keys that stick or jam** because they hit the guide may be straightened by pressing the type bar gently between thumb and forefinger. Don't press the type head lest it snap off.

13. **Key tension** can be adjusted by tightening the screws along the lower rear edge of the machine. Trace the sluggish key to its screw and turn slowly. Test after each half turn.

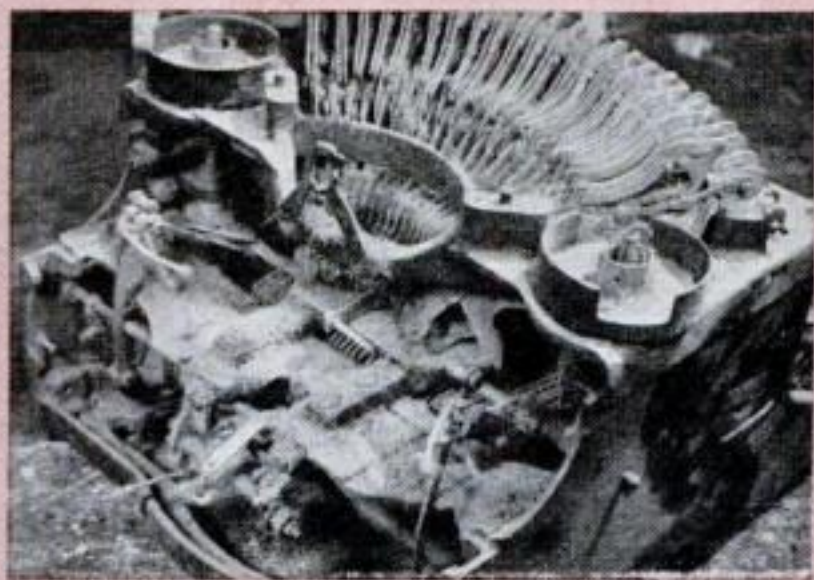
14. **The platen**, or rubber roller, becomes hard in constant use. Rubbing it with a rag dipped in lacquer thinner—or a benzine and alcohol mix—softens it for better paper grip.



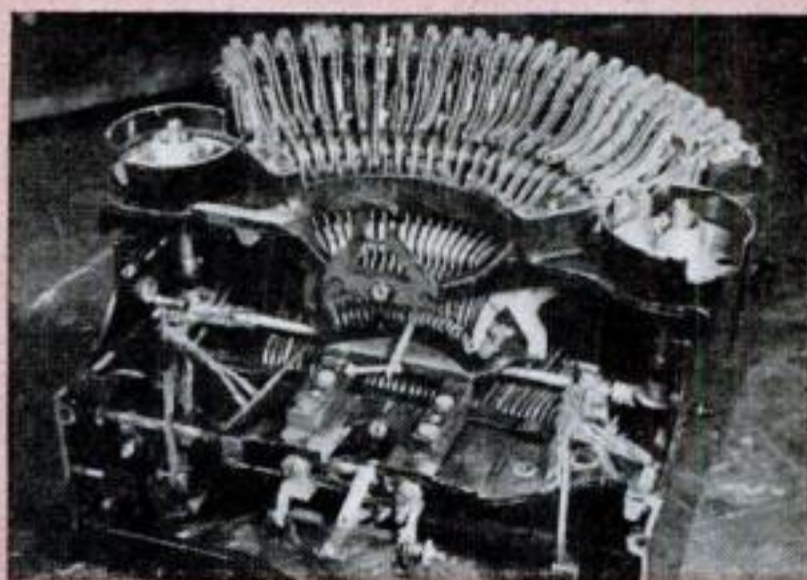
Machines Get Bath in Thorough Shop Overhaul

LIGHT cleaning of the kind pictured on the previous pages can be taken care of without removing the typewriter from its desk. In fact the expert doesn't even have

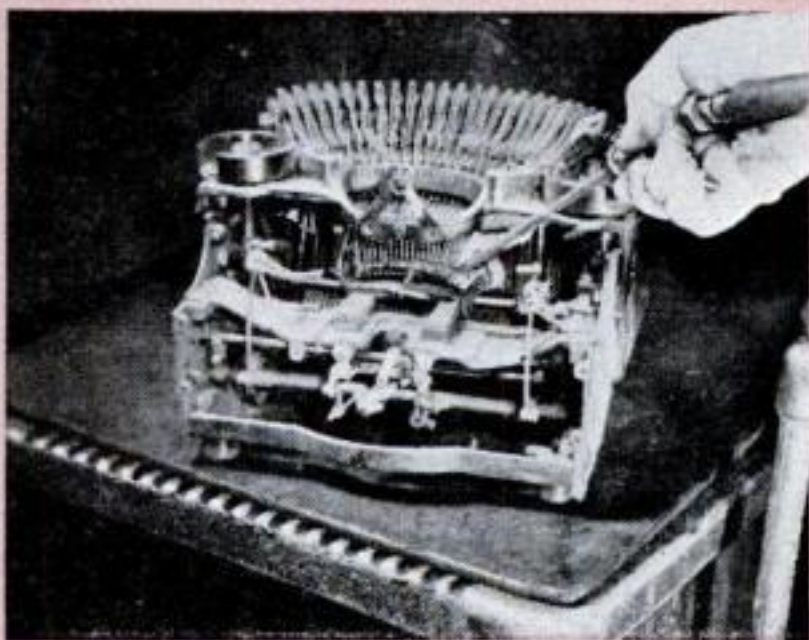
to roll up his sleeves. A really dirty machine calls for different techniques. Here is part of the treatment it gets in Mr. Hoffmann's well-equipped shop.



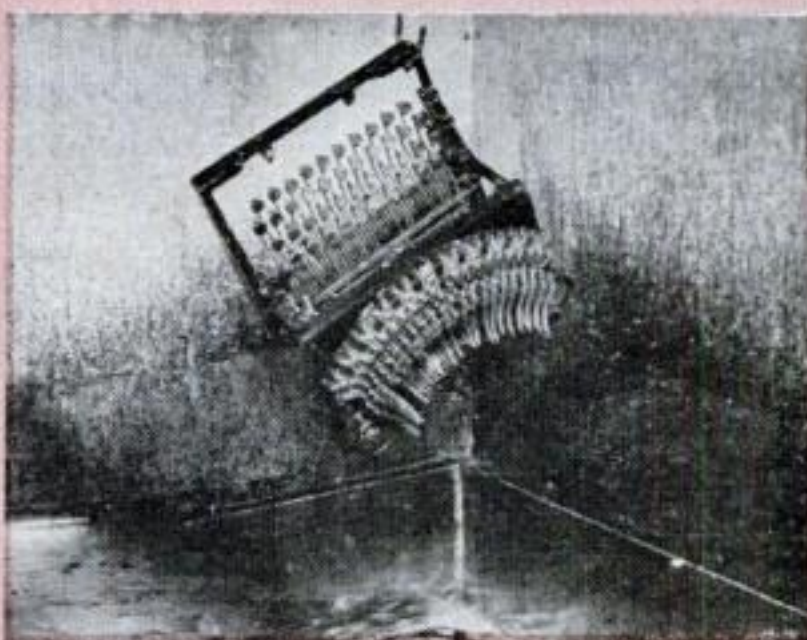
Typical of many typewriters brought in for overhauling, this stripped-down base is almost hidden by a coating of dust and grime. Some long-stored machines are vermin nests.



A few minutes later the same machine emerges from the bath and air-pressure treatment pictured below. Worn-out parts are then replaced and the typewriter reassembled.



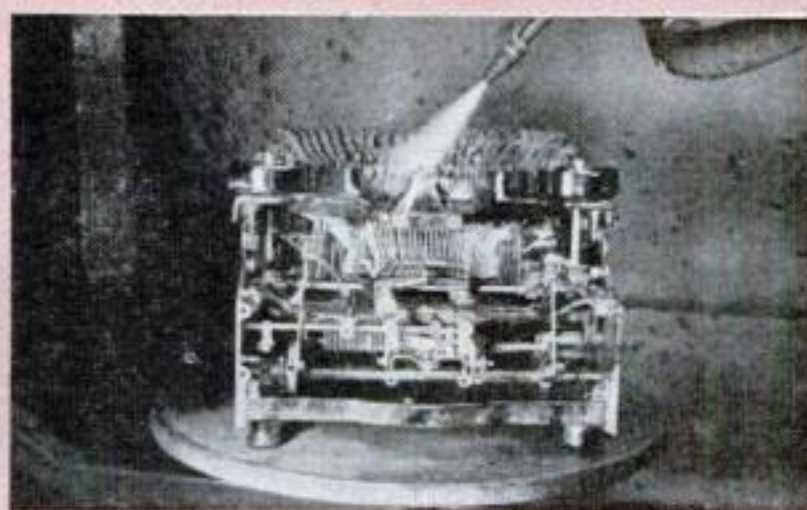
Air blowing under 150-lb. pressure dislodges all loose dirt. The covered tank on which the machine is standing contains a sodium cyanide bath for eating off rust if necessary.



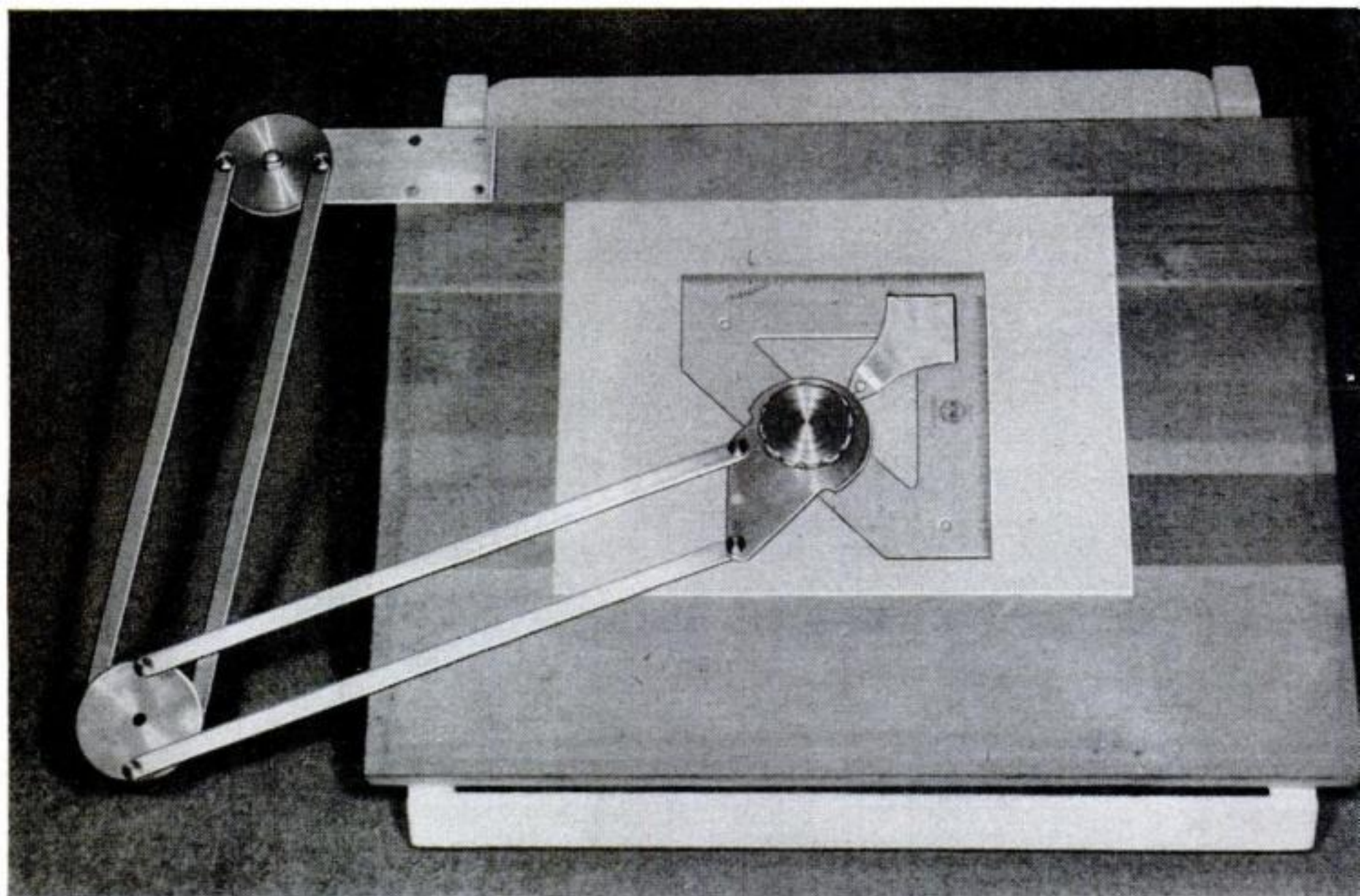
Dunk is the word for this process. Placed in a tub containing special chemical solvents, the machine is left to soak clean. Usual time is 15 to 30 min. It's then hung up to drain.



The solvent is hosed off with scalding water. Compressed air is used again to blow out the water. By this time all but the most persistent grime has been washed or blown free.



Another cleaning compound, sprayed on under heavy air pressure, finishes the job. The turntable on which the machine rests is rotated to make every crevice accessible. END



For professional work or drawings of home and shop projects, this is the machine for the task.

Throw Away Your T-Square

This drafting machine substitutes for a fistful of drawing instruments. You can build it without power tools, or use a lathe for a de luxe job.

By J. C. Magee

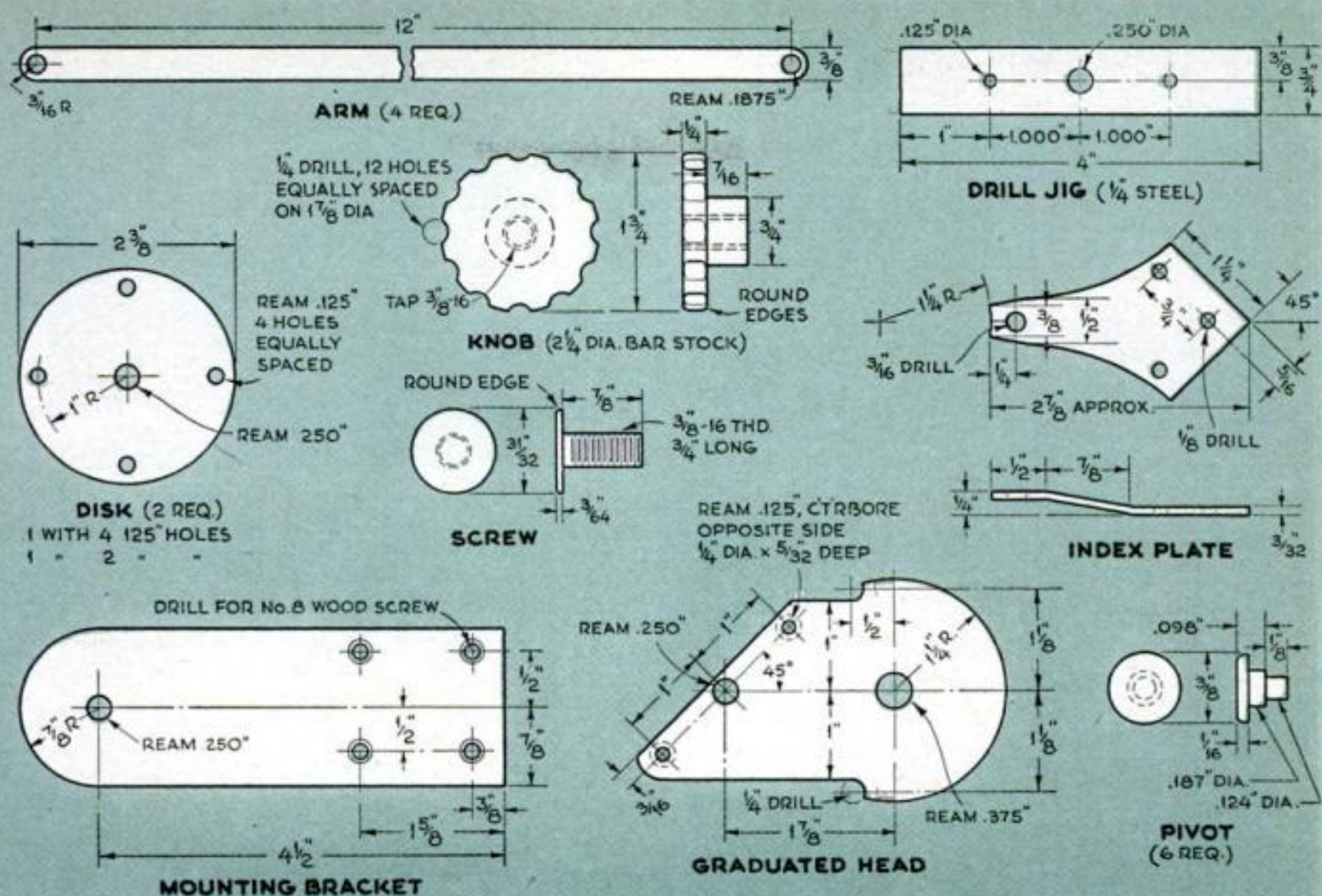
218 POPULAR SCIENCE

TIME spent on drawings can be cut 35 to 50 percent, and what's left is 90 percent fun with this drafting machine. Taking the place of T-square, triangles, protractor, and rules on most jobs, it never falls off the board and doesn't call for three left hands.

The arms, disks, bracket, and index plate are cut from 3/32" dural sheet. As shown, the machine is made largely on a lathe with a jig used to precisely locate and drill the holes. However, a reasonably accurate machine can be built without power tools.

After laying out the holes on one arm, clamp all four together and drill them. For the disks, clamp sheet stock to the faceplate, drill and ream the center hole, and part out to 2 3/8" diameter. To make the jig, a guide block was mounted 3/8" below faceplate center and a locating block mounted about 3" off center. One outside hole was drilled with the jig against the locating block. Then 1" and 2" gauge blocks were used to spot the center and other .125" hole. The jig then was used for drilling the disks and head.

Dowel pins inserted in the first set of holes, a surface plate, and a square were used to locate the jig for drilling the other two holes in one disk. Arms and disks are



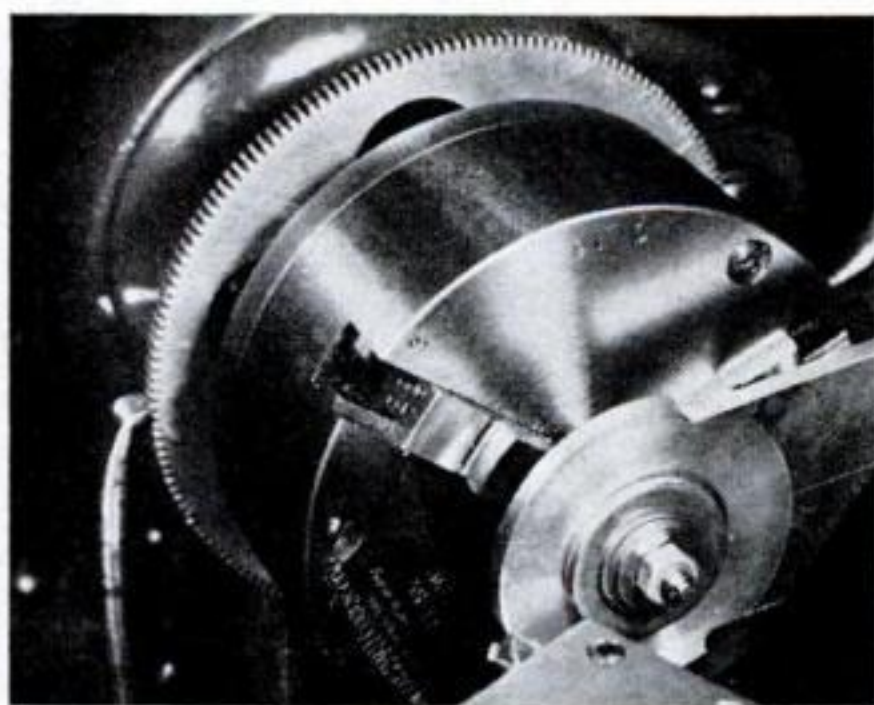
Don't let the decimal-point dimensions scare you, since they're not critical in a hand-tool job.

joined by the pivot pins. The head was graduated by mounting a 180-tooth gear behind it in the lathe, and the scale by means of the compound rest as shown in a photo.

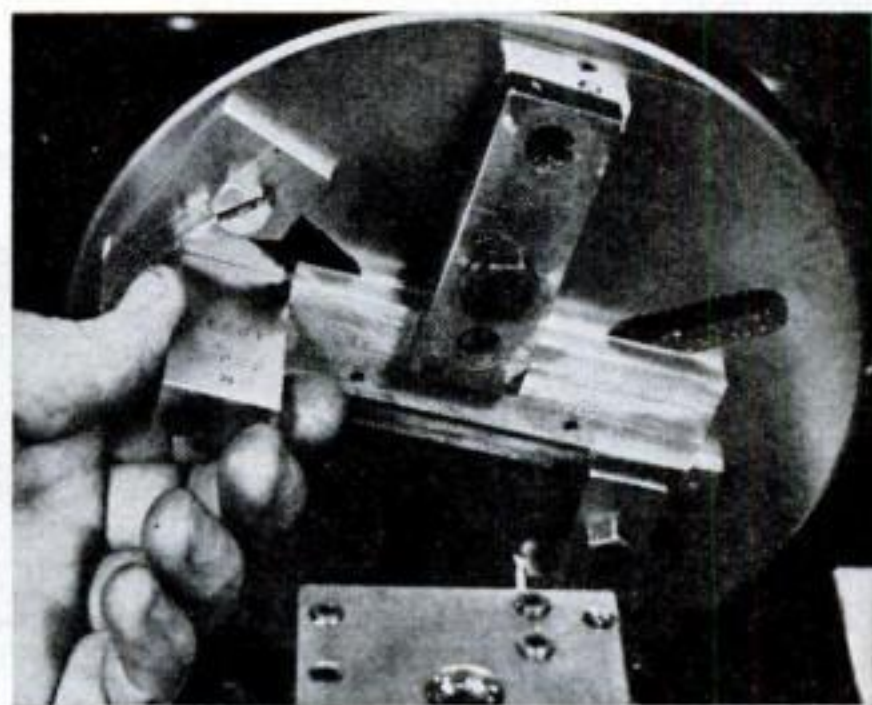
If you don't own a lathe, drill press, or gauge blocks, you can get by with careful workmanship and ingenuity. Instead of turning pivots, get some common 1/8" solid or hollow rivets and, by trial on scrap stock, find

a drill that makes a hole that's a close push fit for them. Use square pieces instead of disks. Omit center holes in them and the .250" hole in the head. They are for the jig only.

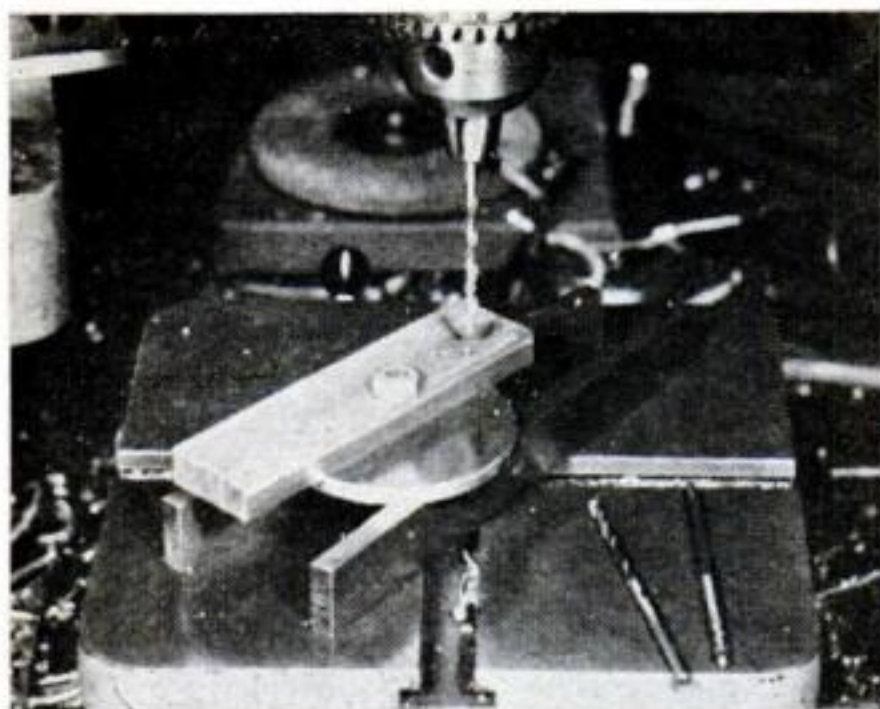
With a good square, lay out two lines exactly 90 deg. apart on one plate. Prick-punch the intersection and swing dividers set at 1" radius to mark the four pivot holes,



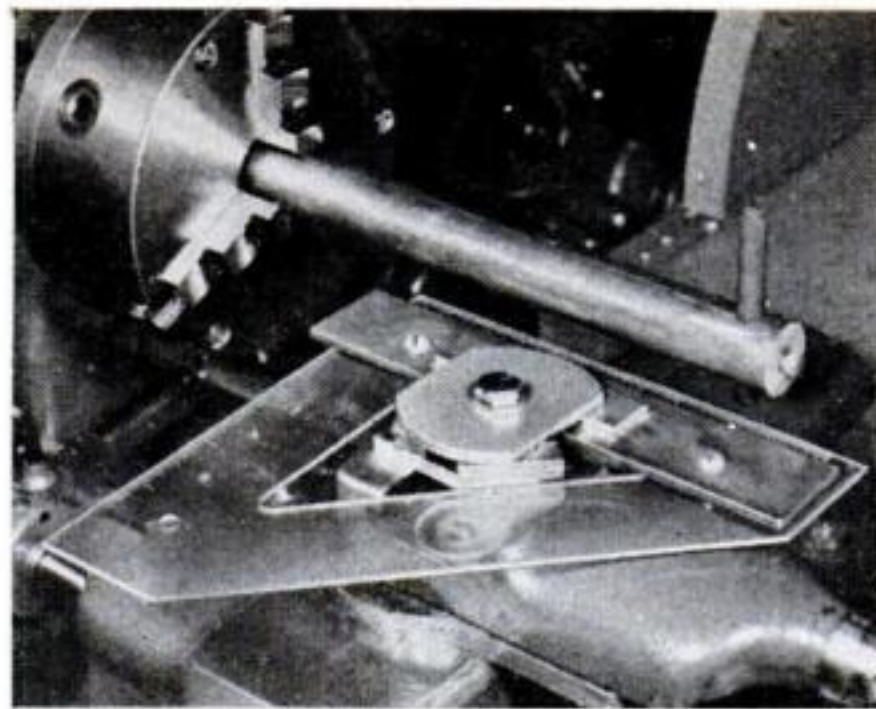
Since lathe had no indexing attachment, a 180-tooth gear was mounted behind chuck to graduate head. Threading tool made the lines.



Gauge blocks were used to locate the holes accurately in the drill jig. Above, a 1" block is used to spot the .250" locating hole.



Jig is used on drill press to make holes in disks and head. Here a $\frac{1}{4}$ " screw holds disk to jig while the .125" holes are drilled.



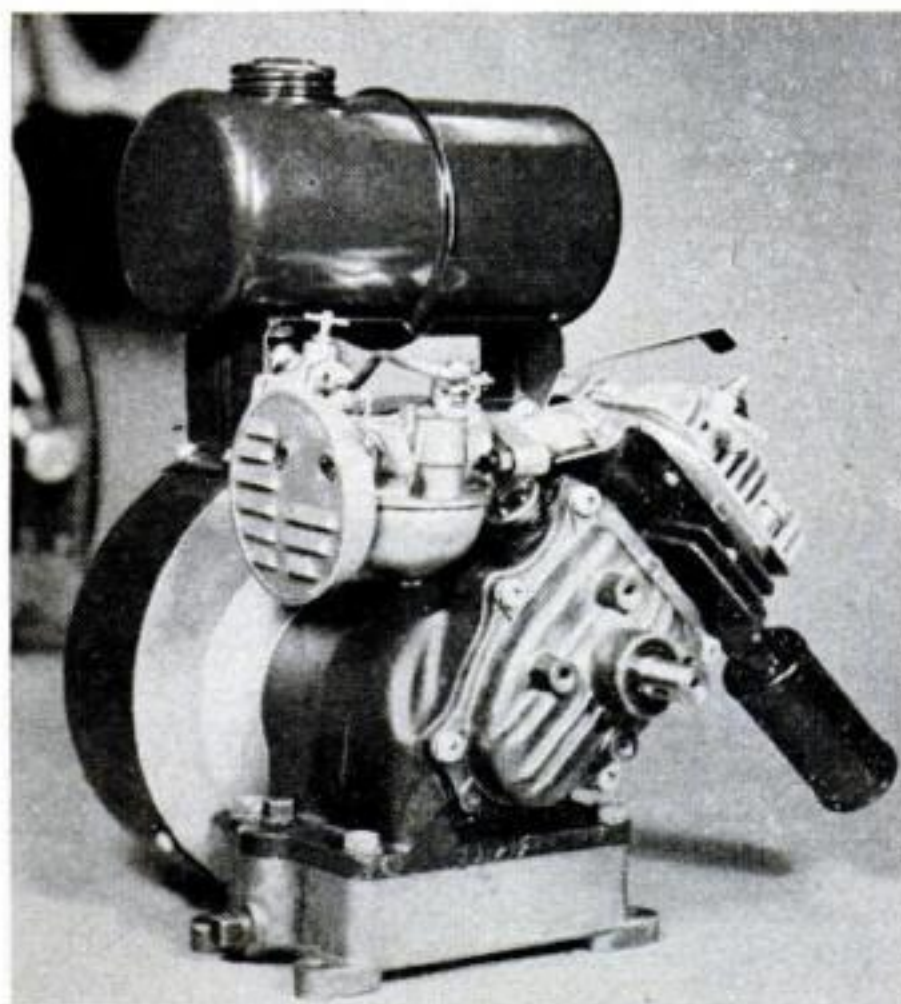
When the triangle was graduated, it was bolted between two steel strips for support. Assembly was clamped to compound slide rest.

and carefully prick-punch the hole locations. Clamp together the two squares and the head and drill two opposite holes right through. Separate the parts and drill the other two pivot holes in the square on which they were laid out.

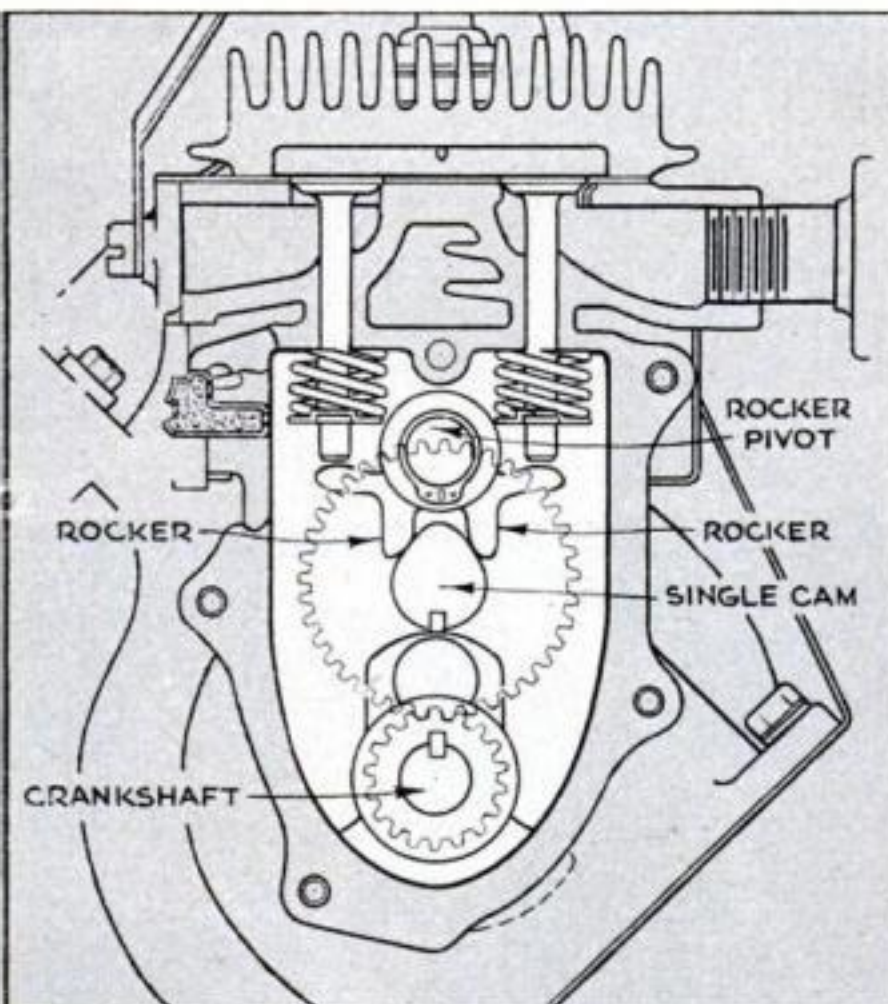
Countersink the holes a bit so the rivets can be filed flush after peening over. Mount

the upper pivot plate tightly on the mounting bracket by one or more bolts. The top disk in the photo was attached by a $\frac{1}{4}$ " bolt through the center hole. It doesn't turn but is solidly clamped. Cement a cardboard or plastic protractor to the head and suitable scales to the triangle. A radio knob can be used instead of the turned knob. **END**

Camshaft Is Power Take-Off of Four-Cycle Engine



This one-cylinder air-cooled engine for power mowers has a built-in 2-to-1-speed reduction, since it uses the camshaft as the power take-off. Another unusual feature of this little four-cycle power plant, built by Reo Motors, Inc., of Lansing, Mich., is the



single cam that operates both valves. As shown in the drawing above, the one cam actuates rockers for both intake and exhaust valves. The engine develops about $1\frac{1}{2}$ hp. at 4,000 r.p.m. (2,000 r.p.m. at the output shaft). Weight is 31 lbs.

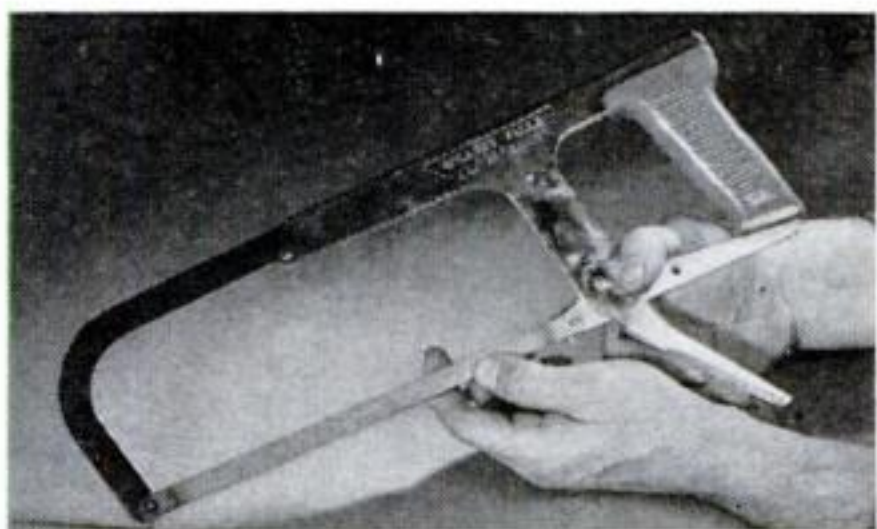


NEW TOOLS



Tool Holds Abrasive Strips.

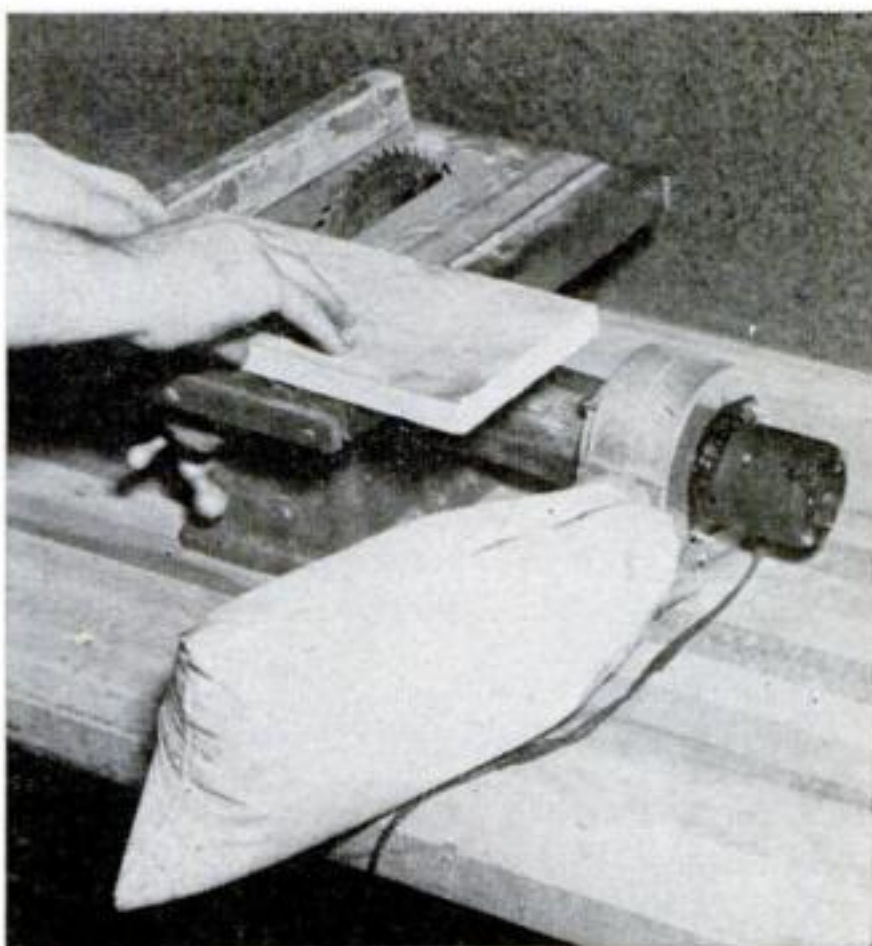
Two jaws, tightened by turning a knob on the end of the handle, keep 1" abrasive strips secure in this finishing tool. It's a product of Master Specialty Co., Inc., Minneapolis, Minn., and sells for about \$1.



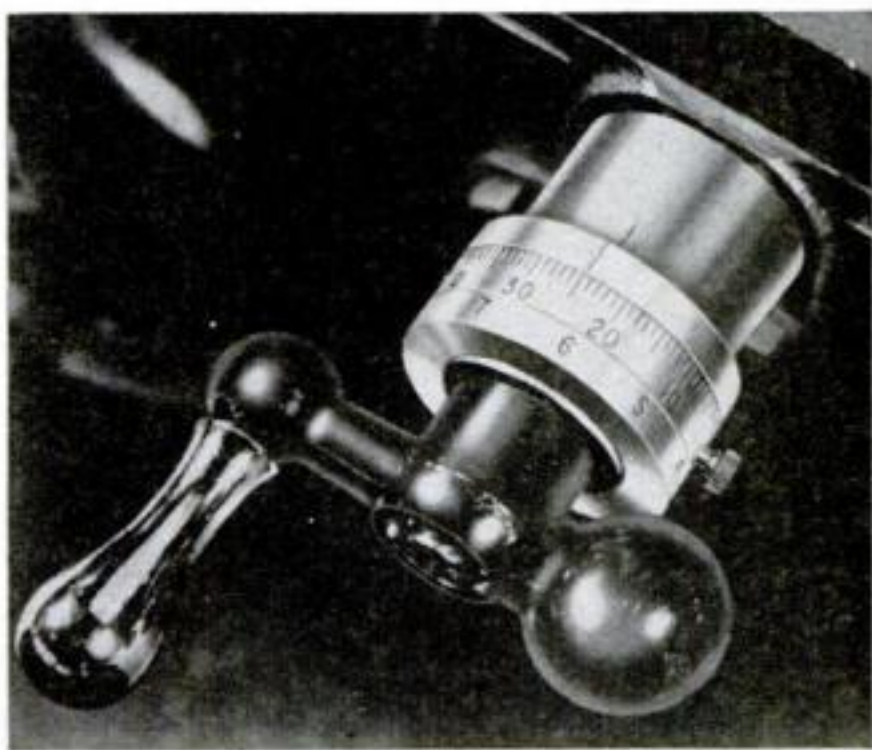
Lever Tightens Blade. In a new hacksaw frame introduced by the Millers Falls Company, Greenfield, Mass., there are no wing nuts to tighten when you change the blade. By means of a cam, the proper tension is applied to the blade when you snap up a lever that hugs the bottom of the handle. The frame is priced at about \$3.50.



One Hand Adjusts Wrench. You can adjust this wrench quickly to any size up to 15/16" even with work gloves on. Adjustments are made by sliding a thumb ring back and forth along the handle. Once set, the jaw stays put. The Trebor Machinery Co., of Milwaukee, Wis., makes the wrench. It retails for about \$3.60.



Bag Collects Shop Dust. A motor-driven impeller in this new shop accessory sucks dust, shavings, and chips into a collecting bag while you work. Called a Dust-O-Vac®, it can be used with a circular saw, bandsaw, or jigsaw, a grinder, sander, shaper planer, wood lathe, and other tools. Universal Yonkers Corp., Yonkers, N. Y., includes with each device diagrams showing how the collector can be attached to any tool.



Dial Speeds Machine Work.

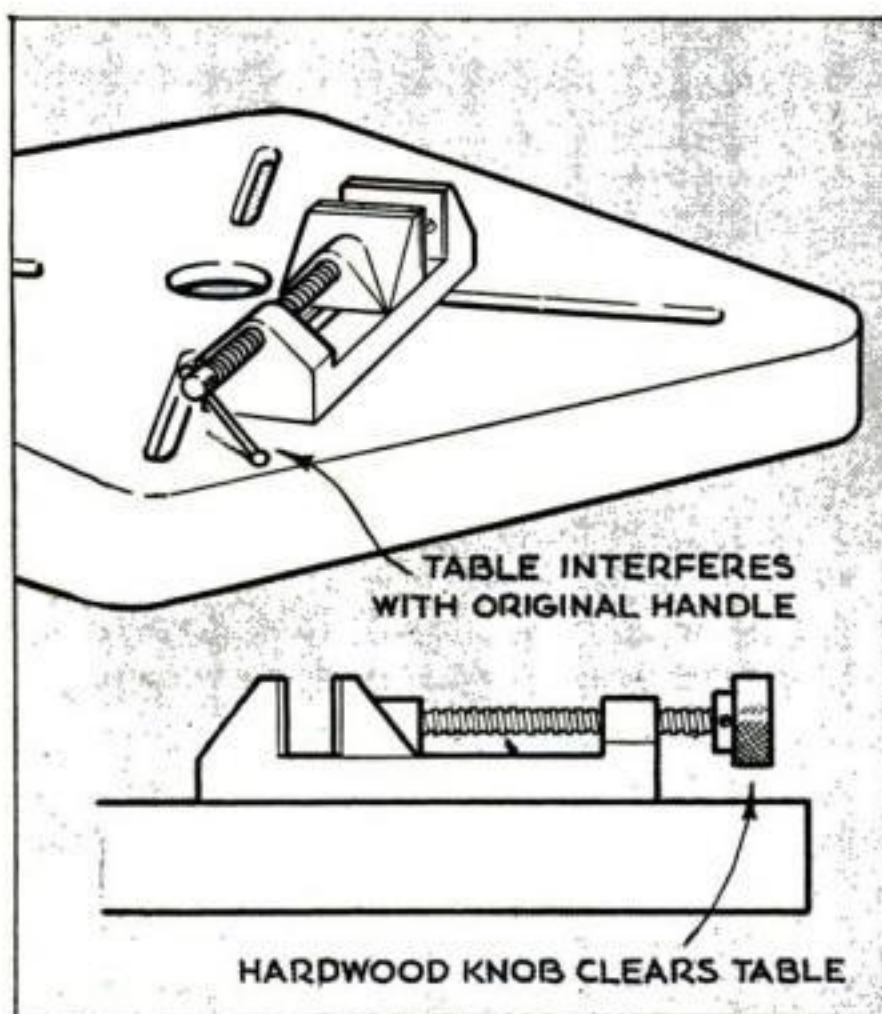
Here's a dial that helps you get accurate cutting-tool adjustment or precise table movement on machine tools employing screw-feed travel. Made by Van Dyke Instruments, Inc., Glendale, Calif., it consists of two inter-gear dials. The first reads in thousands of an inch. The second reads in tenths and keeps track of the revolutions of the first. It takes shafts from 1/4" to 11/16".



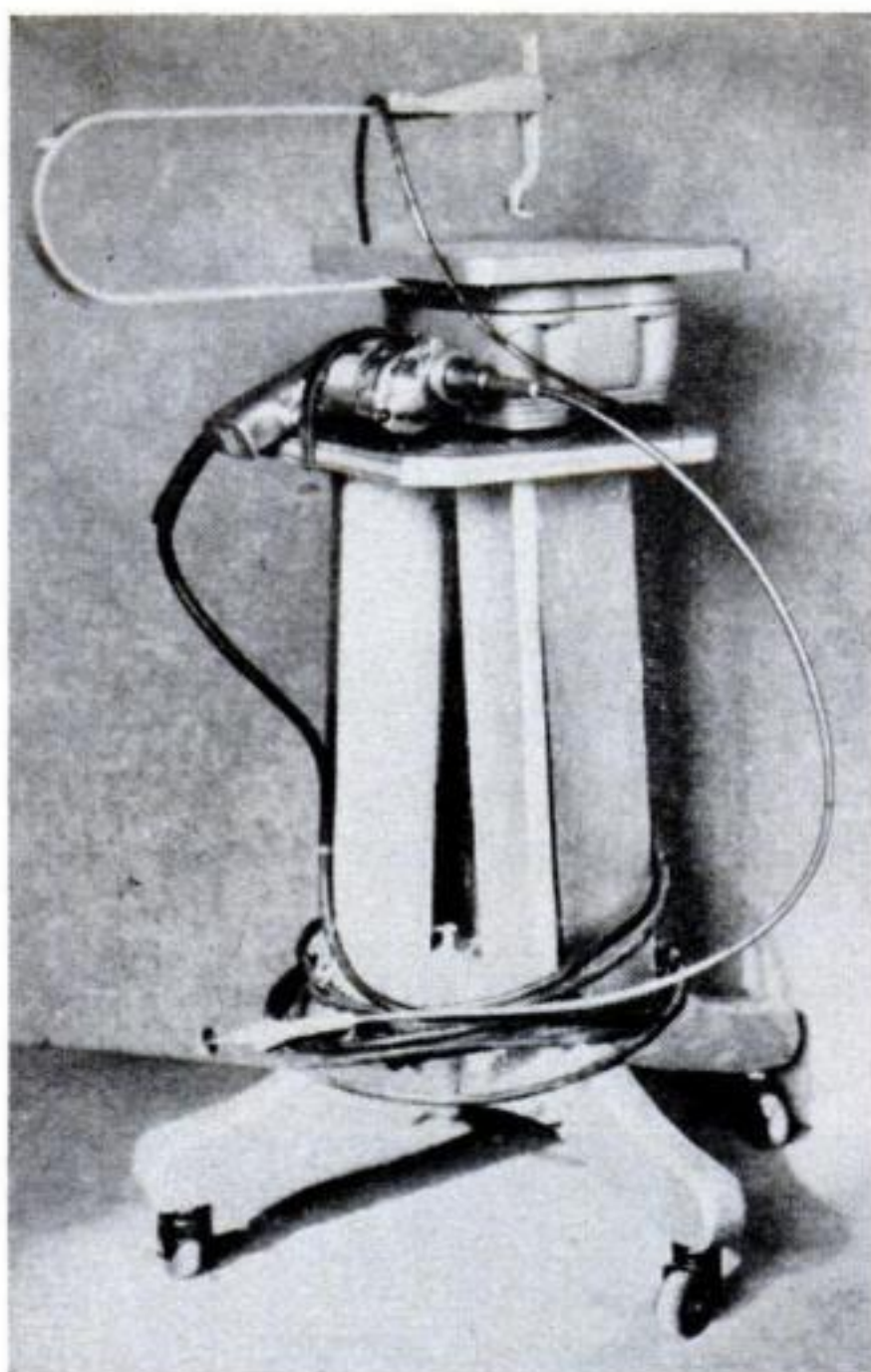
NEW SHOP IDEAS



Shield Stops Chips. It's hard to clean under the headstock of many bench lathes, and the space there soon fills with metal and plastic chips, mixed with cutting and lubricating oils. A sheet-metal shield between the ways, held on with small tabs, will keep chips where you can readily brush them away.—*John M. Avery, Dexter, N. Y.*



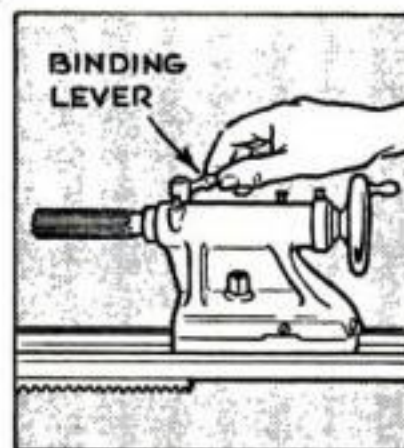
Knob Improves Vise. Annoyed by the way the conventional handle on my drill-press vise struck the table whenever it was adjusted, I cut off the handle and substituted a round knob turned from maple. The knob was drilled a tight fit for the screw shank and cross-drilled for a securing pin. Incidentally, I've found that maple can be knurled beautifully in the lathe at light pressure.—*H. R. Pfister, Bronx, N. Y.*



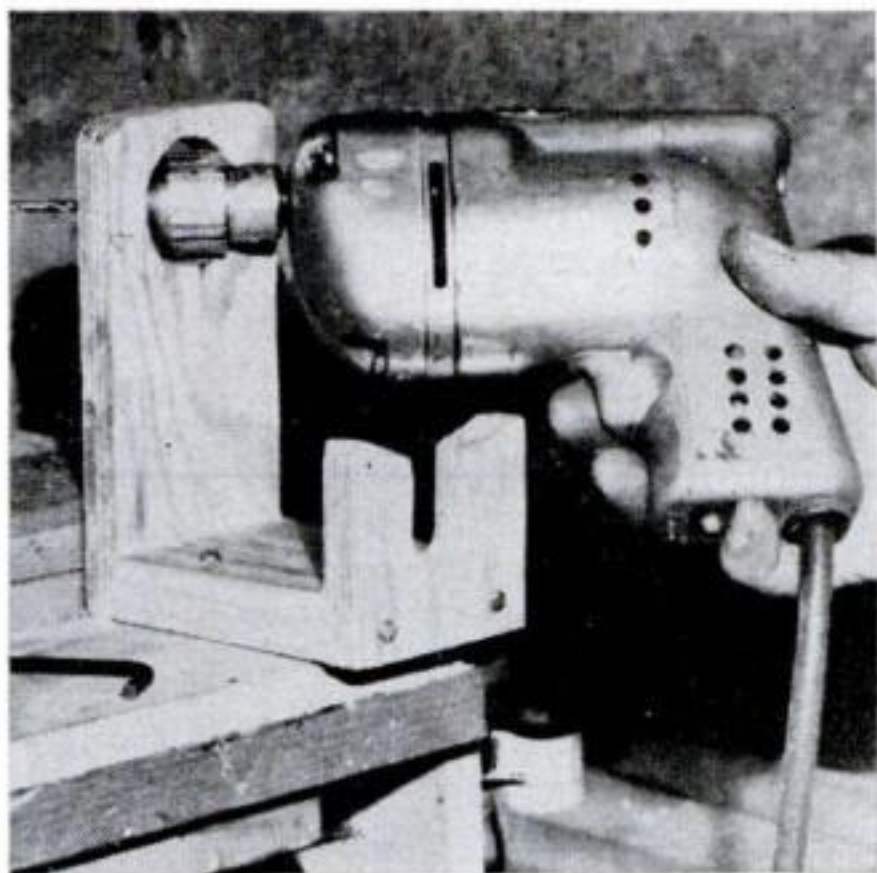
Chair Base Makes Stand. The base from a discarded swivel chair and a few pieces of scrap pine got together to make this handy portable tool stand. We use it in a modelmaking shop to hold a light magnetic jigsaw and a drill-driven flexible shaft—two tools in demand at different benches and therefore good to have easily movable. The four 1" by 4" by 20" uprights are held to the base by wood screws, and the 12" square top is secured with finishing nails driven down into the uprights.—*Walter Kateley, Cleveland.*

Stops Chatter.

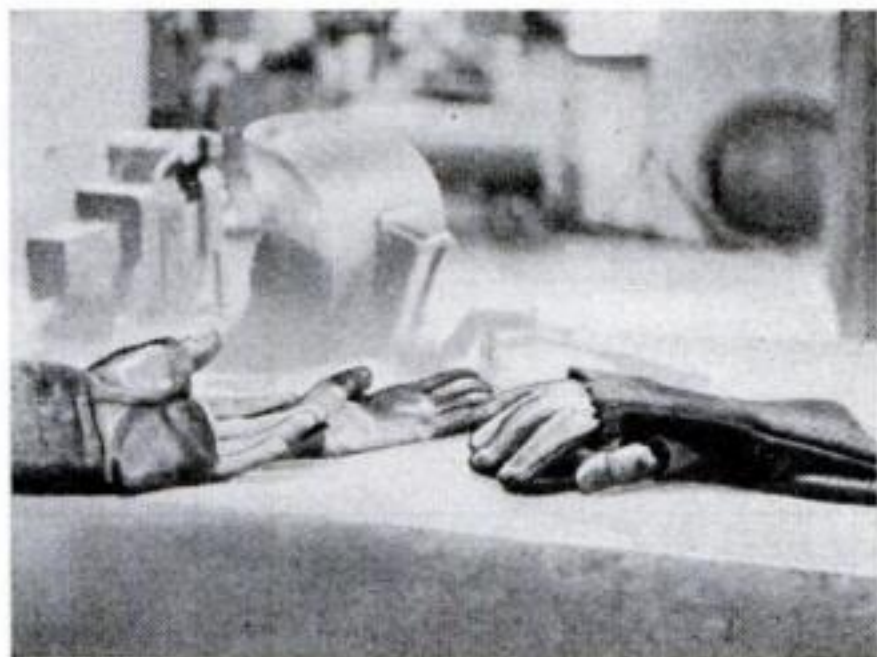
With many old lathes, looseness around the tailstock ram will cause chatter in reaming operations. Sometimes also a large drill in the tailstock will wander at the start of a hole. The remedy



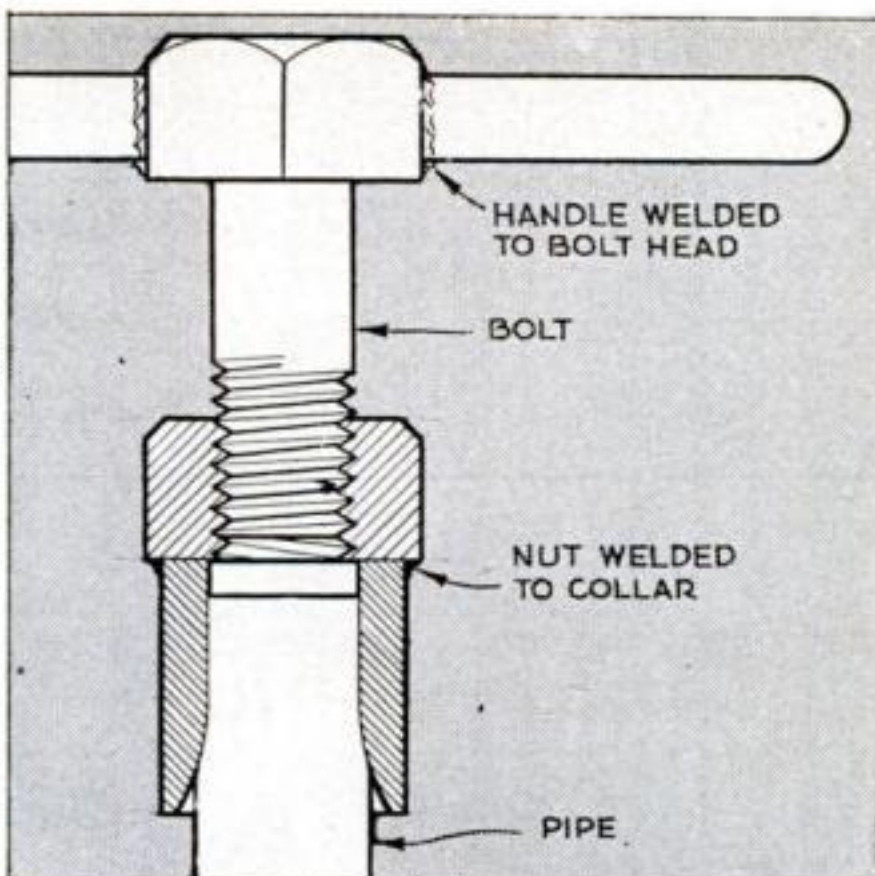
for both troubles, I find, is to tighten up a bit on the binding lever until you feel a little drag on the handwheel.—*John C. Martin, Kings Point, N. Y.*



Rack Holds Drill. Although handy for many bench jobs, a small electric drill does not always get full use because it is awkward to stow away or get out. I made myself the simple plywood rack shown above, tailoring it to suit the shape of my drill, and screwing it down at a spot where it can be reached in an instant. A power outlet for the plug should of course be near-by.—A. H. Smith, Hawthorne, N. Y.

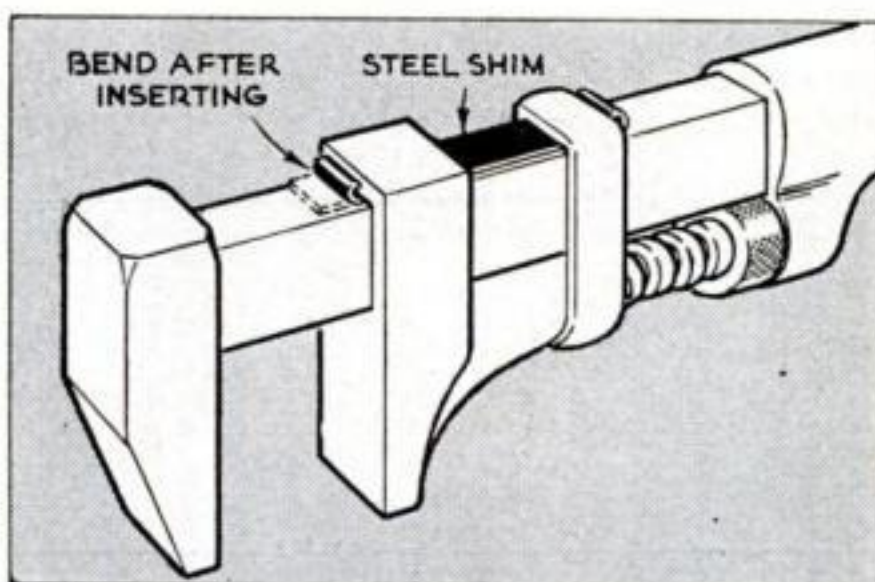


Low-Cost Welding Gloves. One welder, exasperated at the high price of all-leather gauntlet-type welding gloves, noted that they wore out at the fingers long before full wear had been had from the rest of them. He cut the fingers from a worn pair at the knuckles and inserted a pair of inexpensive leather-front, cloth-back work gloves. These cost him 69 cents a pair, compared to \$3.50 for the all-leather ones. He reports that the inserted ones last about as long and can be replaced easily, and that the gauntlet parts seem to last indefinitely.



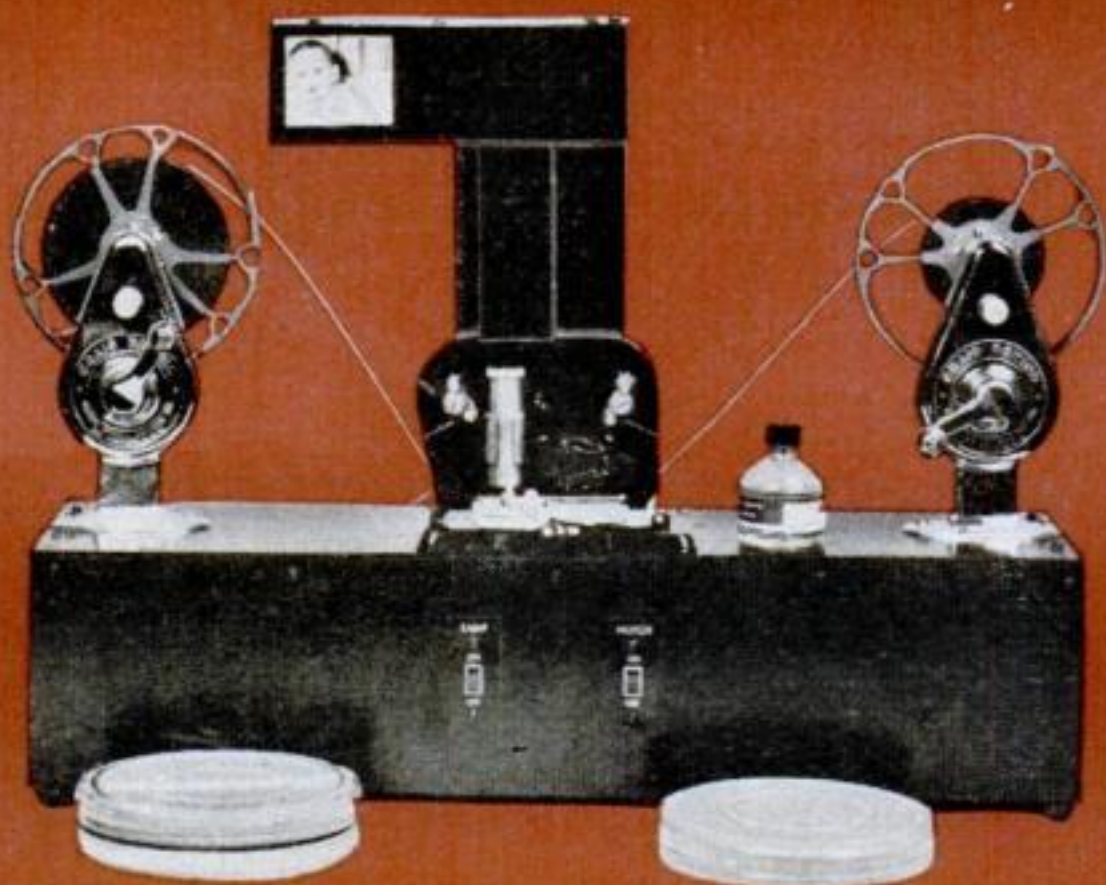
Collar Swages Pipe.

In one machine-shop job it was necessary to thread the inside of the ends of some $\frac{3}{4}$ " pipe. However, the pipe quite often was found to have an oversize i.d., resulting in little or no thread. The fault was corrected by forcing a tapered swage or collar over the end of the cold pipe with an arbor press. A large nut was welded to the collar, and a bolt with welded handles removed the tool from the pipe when it had done its work.—Paul F. Reents, El Monte, Calif.



Shim Tightens Wrench. Worn monkey wrenches of the kind pictured above are difficult to set up tight against a nut because the jaws lose parallelism under pressure. For a semipermanent repair, bend up a roll on the end of some steel strapping, slip it under the back, and bend up the other end.—Wallace Genthner, Troy, N. Y.

Action Editor Previews Home Movies



By Ray Heiskell

THERE are no two ways about it. If you take home movies, you've just got to have an editor to keep from boring your friends. Without it, you can show movies, but unless they're cut and arranged in effective sequence, there's apt to be no one around when your next show begins.

But what can you do? A good film editor costs almost as much as a good projector. If you've already strained your pocketbook to get a camera, projector, and other necessary odds and ends, an editor may seem exactly like that last straw on the camel's back.

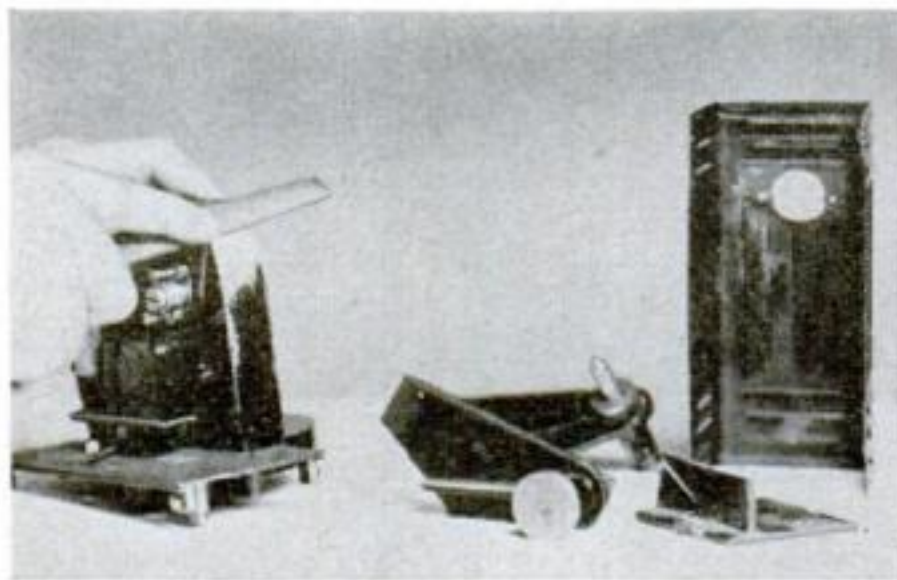
However, there's hope. On these pages you can take a look at my action editor. It

does an excellent job. It enables me to see the action just as it will appear on the regular projection screen. The editor cost me less than \$15, including the rewinds and the splicer.

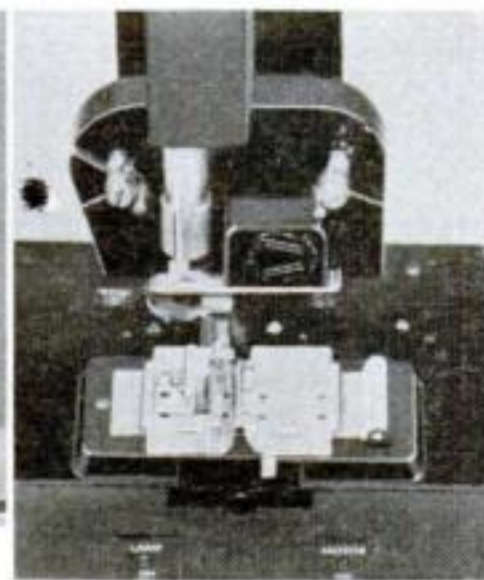
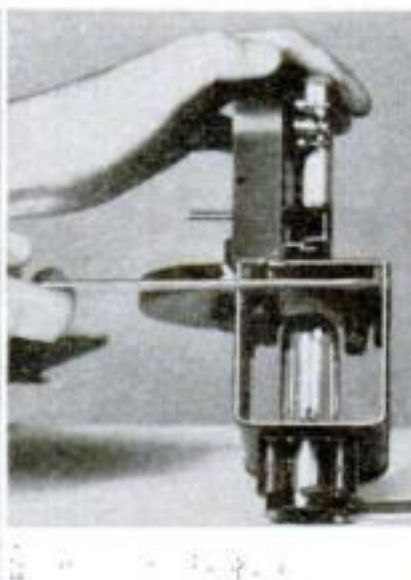
There's just one hitch. The starting point was an old projector that I'd discarded because I now have a new one. If you also have an old one, you're in real luck. If not, you may still find a bargain on the used photo-equipment counters.

The projector I used was a Univex, model P-8. But other makes could be adapted to the same purpose, with only minor changes from the procedure I followed.

Using a hacksaw where necessary, take the projector apart. The film gate, film-feed claws, gear train, lens, and motor are



Take the projector apart, removing parts that you won't need for the editor. Smooth any cut edges with a file. Do not disturb the operation of the gear train that gives the intermittent action. Since the lens will be used vertically in the editor, it's necessary to remount the pro-



jection bulb (center) so it will burn base down. Protect the film from overheating by locating a glass disk between the bulb and lens. A drawer was installed in the splicer (right) to catch film cuttings. This simplifies clean-up operations. The film sprockets were discarded.

the main parts you need. If the projector is pretty badly worn, as mine was, it may be necessary to rebush the bearings and smooth some of the shafts.

Remove the fire screen and lamp socket from the lamp housing. Then hacksaw off a section of the housing directly behind the film aperture and lens. Cut a $\frac{3}{4}$ " hole in the housing directly beneath the film aperture and mount the socket in the hole.

When the editor is in use, this will allow the lamp to burn base down. The bulb is not being used efficiently, but it must burn base down or the filament will sag and burn out. I use a 100-watt projection bulb. A larger one can be used, but this is not recommended unless provision is made for forced-draft cooling. I find that a 100-watt bulb gives all the intensity needed.

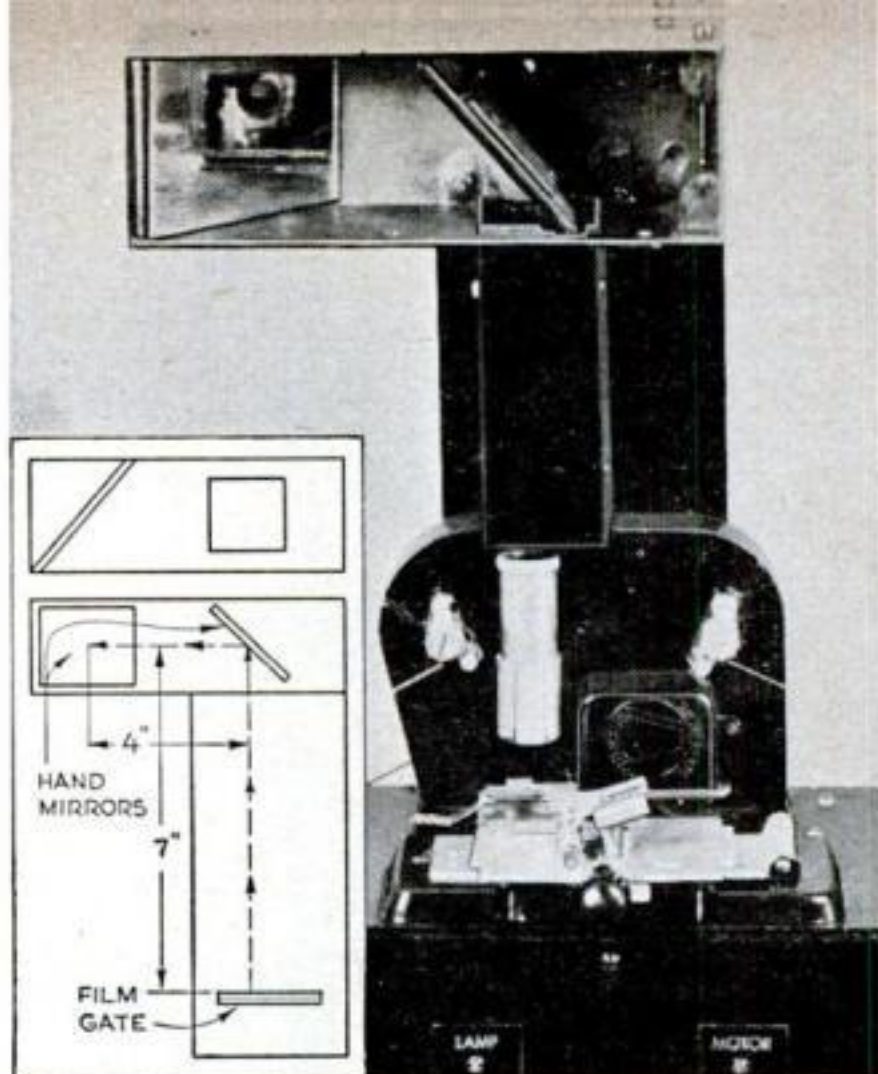
The $4\frac{1}{2}$ " by 6" by 20" base can be built from plywood, using $\frac{3}{4}$ " quarter round in the corners. If you want to use 400' reels, you'll probably find it best to increase the base length about 4". The mechanism is mounted inside the back panel with machine screws, but the top must be cut out at the back edge to accommodate the shape of the mechanism. Make a circular cut-out in the top panel between the lamp and lens and insert a glass disk $\frac{1}{4}$ " thick to keep the film from overheating.

The housing for the mirrors was made of sheet metal, assembled with machine screws and solder. The construction could be simplified by using plywood. The image is projected up a rectangular tunnel, $1\frac{1}{2}$ " by 2" in cross section. The upper, horizontal part measures $2\frac{1}{4}$ " by $2\frac{1}{2}$ " by 7", and the back supporting panel is $3\frac{1}{2}$ " by 10". This panel is screwed to the back of the gear-train housing.

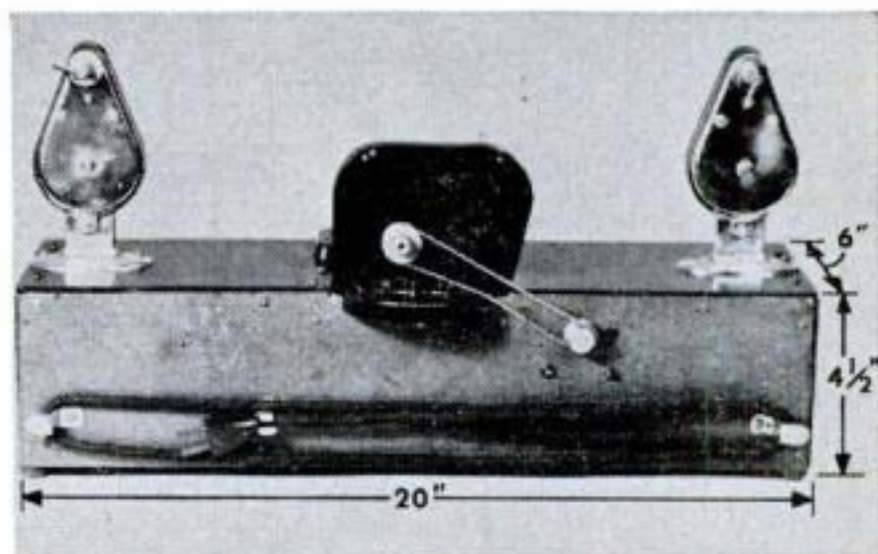
An accompanying diagram shows the layout of the optical system. You view the image on a piece of ground glass mounted in front of the second mirror.

Switches were taken from the control panel of the projector, the panel being cut to retain the lettering. These were then mounted on the editor base.

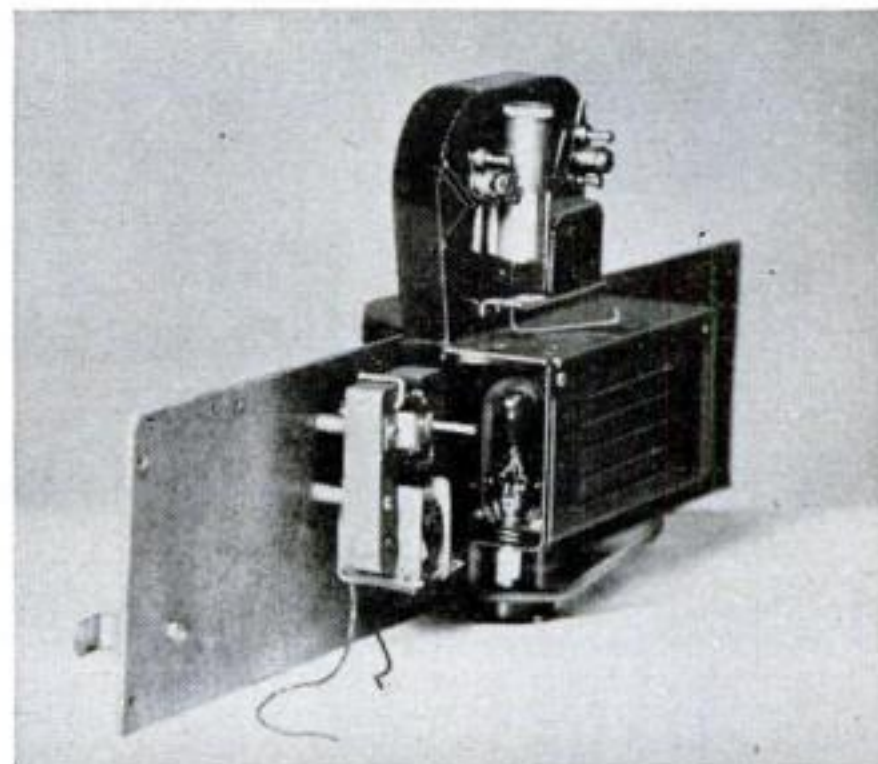
It will be noted in one of the photos that the splicer has a drawer in its base. I added this to catch the film cuttings. The film sprockets were not used because of the difficulty of removing the film for splicing. The film is run directly from the supply reel to the film gate, then to the takeup reel. Slack is taken up by the rewinds as the film is fed.



Two hand mirrors serve as the optical system. Located at the distances shown in the diagram, these give a projected image about $1\frac{3}{8}$ " by $1\frac{3}{8}$ ". The top drawing shows a plan view.



A belt from projector drives the intermittent gear train. Two clips installed on the back of box are convenient for winding electric cord.



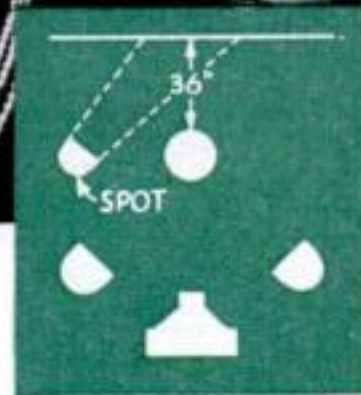
Entire mechanism is mounted to the back panel of base. Use machine screws inserted from the outside. The motor is seen in foreground.



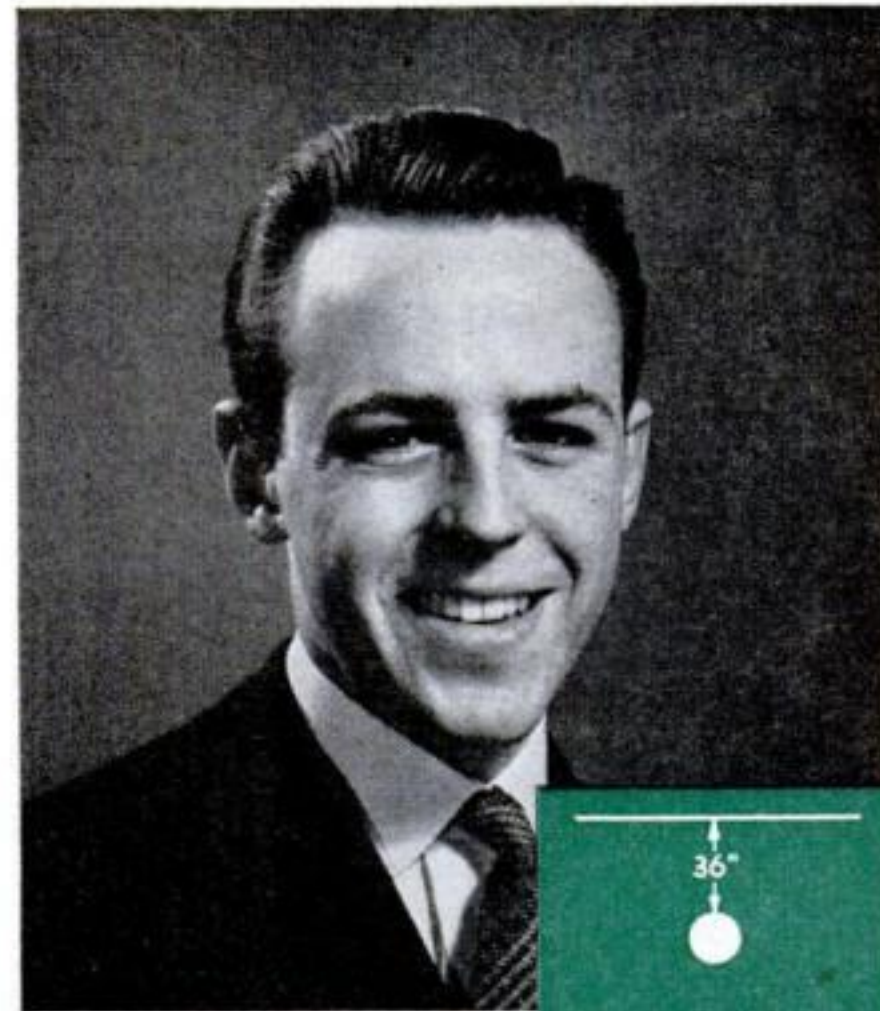
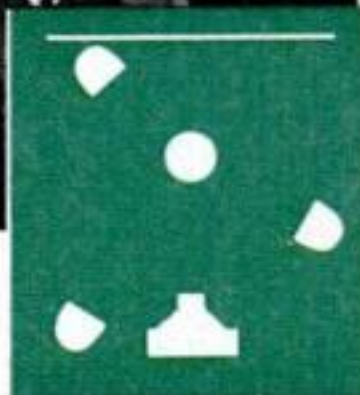
Light Background. Key to this effect is a floodlight. Direct it to cover more than picture area.



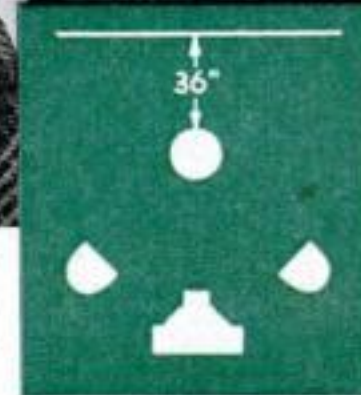
Dark Corners. A spotlight turns this trick. Though corners can be "burned in" on print, this is better.



Black Background. Outline the subject by using back and side lights without lighting background.



Gray Background. Use no background light. Vary background tone by moving sitter in or out.



Four Effects with One Background

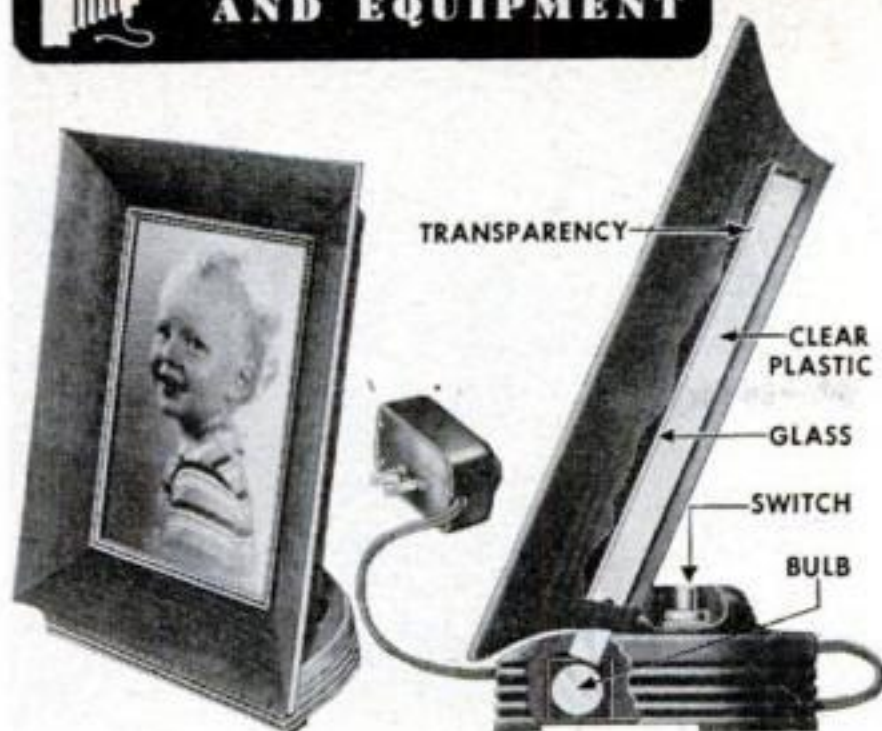
FOR portraits, it's fine to have an assortment of backgrounds on hand. But they aren't necessary. With just a plain white wall or light window shade, you can give your photos backgrounds of varying tone.

To do this, you control the relative amount of light that falls on background and subject.

You can even produce the effect of a black background with a white one.

In the examples at top of page, the flood and spot either can be located as shown or be hidden behind the sitter. Place front lights so shadows fall outside the picture area.—
Kenneth M. Swezey, Brooklyn, N. Y.

PHOTO IDEAS AND EQUIPMENT



Frame Lights Transparencies.

The light from a 4-watt fluorescent tube in the base of the frame is diffused through a block of clear plastic to light a color transparency. Chromo-light[®], made by the S. E. Overton Co., South Haven, Mich., comes complete with bulb and a 7' cord with ballast. The company recommends letting the bulb burn continuously since it uses little current and it will last indefinitely if not repeatedly turned on and off. The little heat produced by the tube won't harm the film.

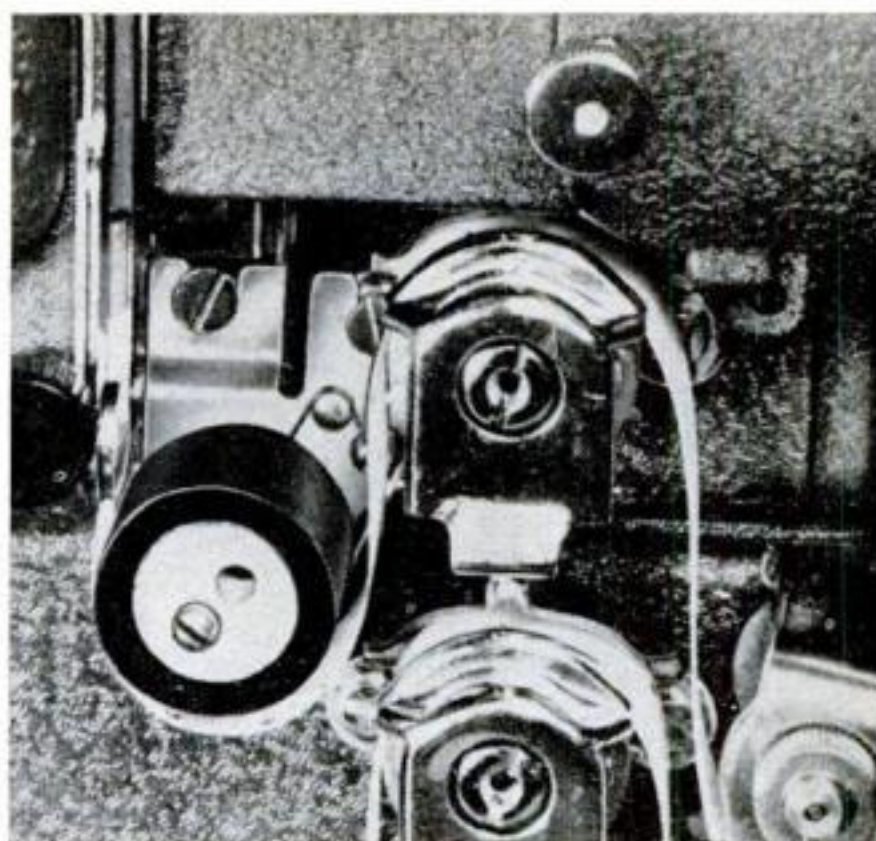
Enlarger Makes Color Prints.

If you wish to make contact Printons[®] from color transparencies, your enlarger will let you use smaller and less expensive color-compensating filters. Otherwise you'd have to use filters as large as the transparency. Insert the filter in the enlarger and put the transparency and Printon on the easel.

Simple Negative Washer. Uncut roll film can be washed safely and efficiently with a funnel. Roll the film loosely and set it on edge in a beaker. Place the funnel so

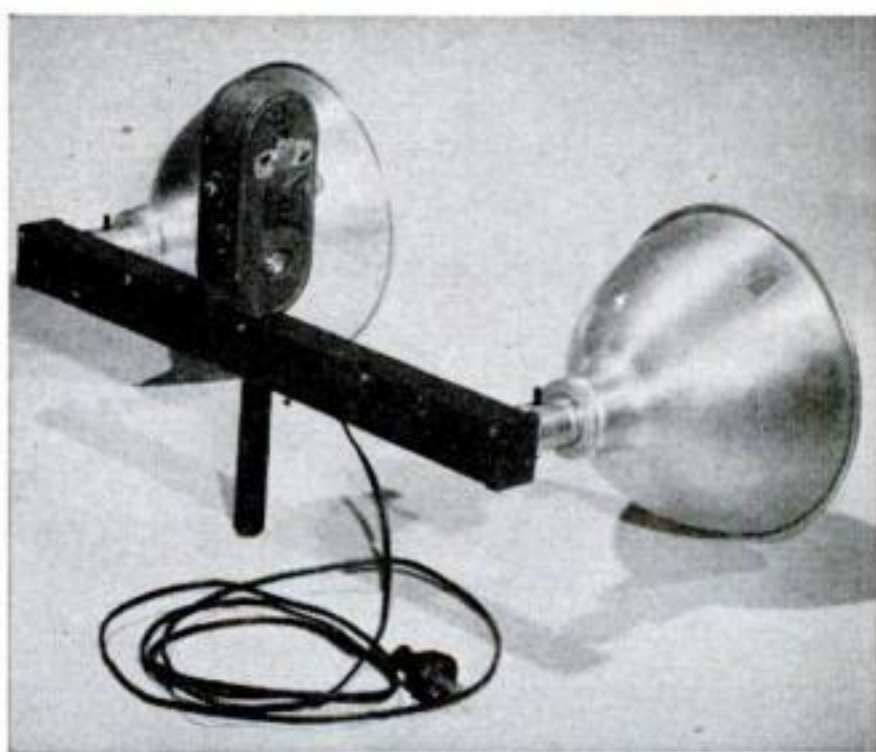


its lower end enters the center of the roll. Water is then forced upwards through and around the film, flowing over the beaker sides. Check to be sure the roll isn't too snug, unwinding it and rerolling it if necessary.—Max Alth, Yonkers, N. Y.



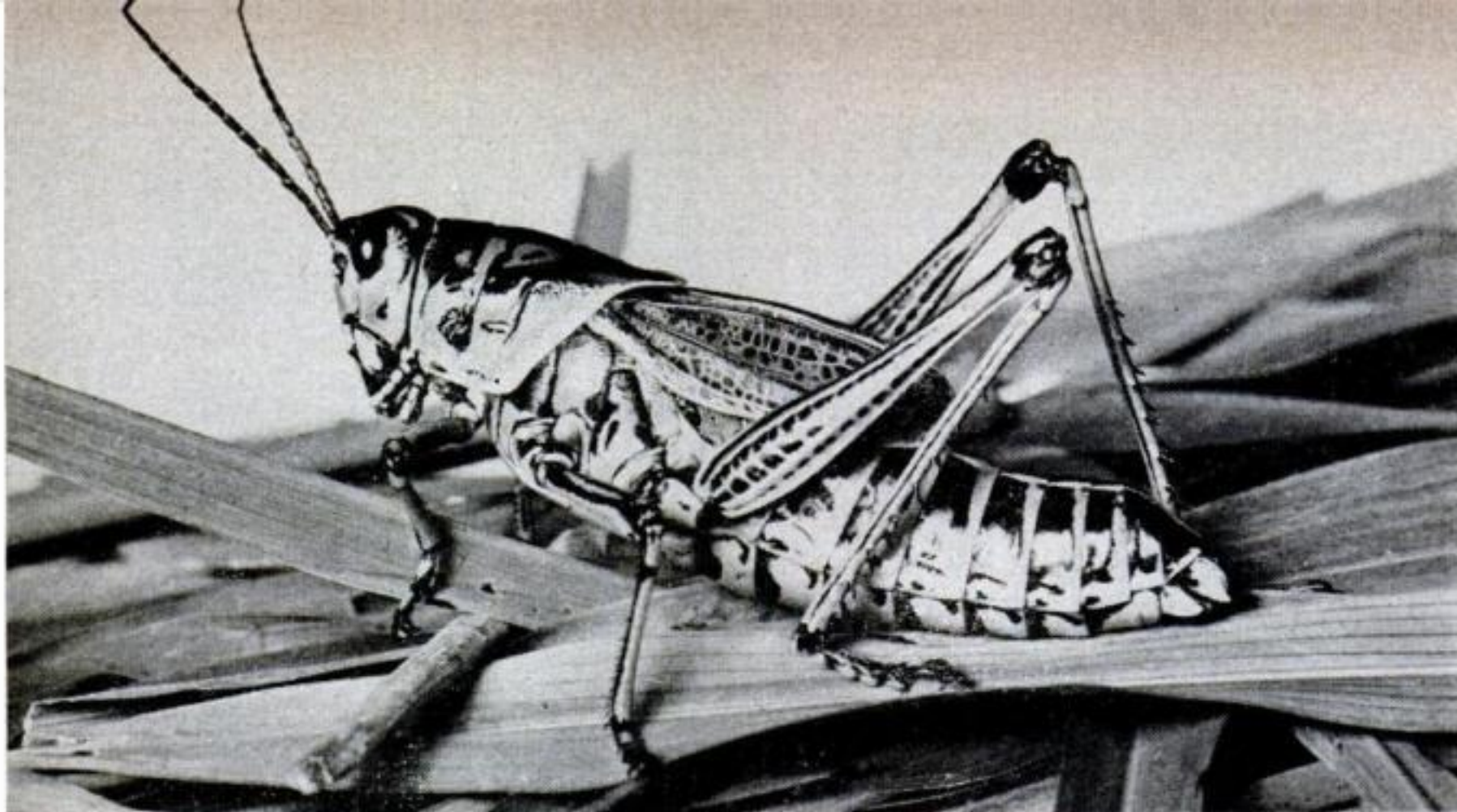
Roller Maintains Film Loops.

The Morton Sentry[®], for use on most 8-mm. and 16-mm. projectors, guards the lower film loop where 90 percent of film damage begins, according to the maker, the Morton Company, Minneapolis, Minn. Attached by screws already on the projector, the device is a roller pivoted off-center. When the lower loop starts to tighten, it contacts the roller which pulls the film past the damaged spot and automatically resets the loop with no interruption in the showing.



Light for Posing and Shooting.

Called the Hi-Lo Lite[®] by the maker, Engineered Products Co., Cincinnati, Ohio, this twin fixture provides a low light for posing subjects and a high-intensity light for shooting stills or movies. A DPDT switch puts the lamps either in series or parallel. It lists for about \$10 with aluminum reflectors, and about \$7.50 without. It also can be screwed to a camera tripod.

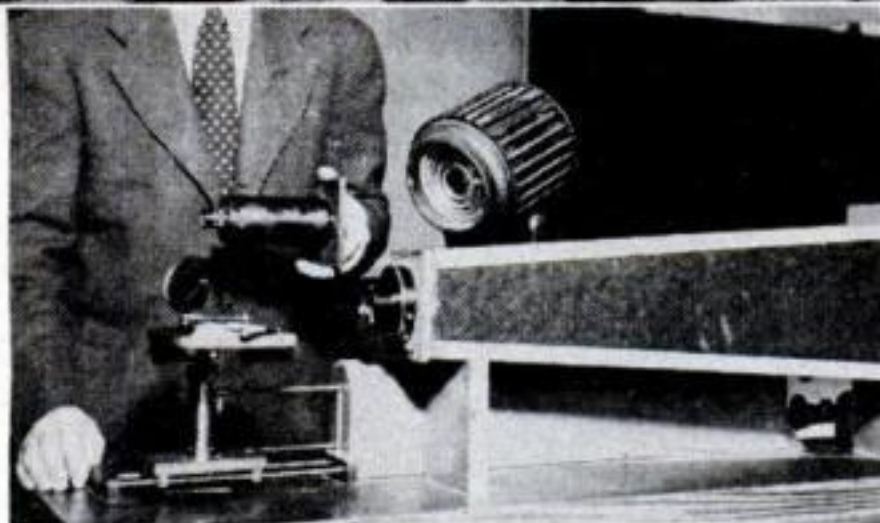


Camera Takes Bug Portraits

SPEED flash caught this grasshopper at $1/5,000$ th sec. The picture was taken with a camera built by members of the entomology department at Mississippi State College especially for photographing insects.

Of the fixed-focus type, the camera has no bellows. Instead, there's a 30" tunnel formed of composition board, painted dull black inside. A slot at the back takes 4" by 5" film holders.

Specimens are posed on a stage attached to a rack and pinion from a dissecting microscope. To give back and forth adjustment, this in turn is mounted on a platform that slides on two parallel rods running to con-



trols at the rear of the camera. Interchangeable lenses of different focal lengths make it possible to use the camera for large or small specimens. Considerable magnification is obtained with a 35-mm. lens. Speed flash is used for living specimens.

Easel Displays Prize Prints for Salon Judging

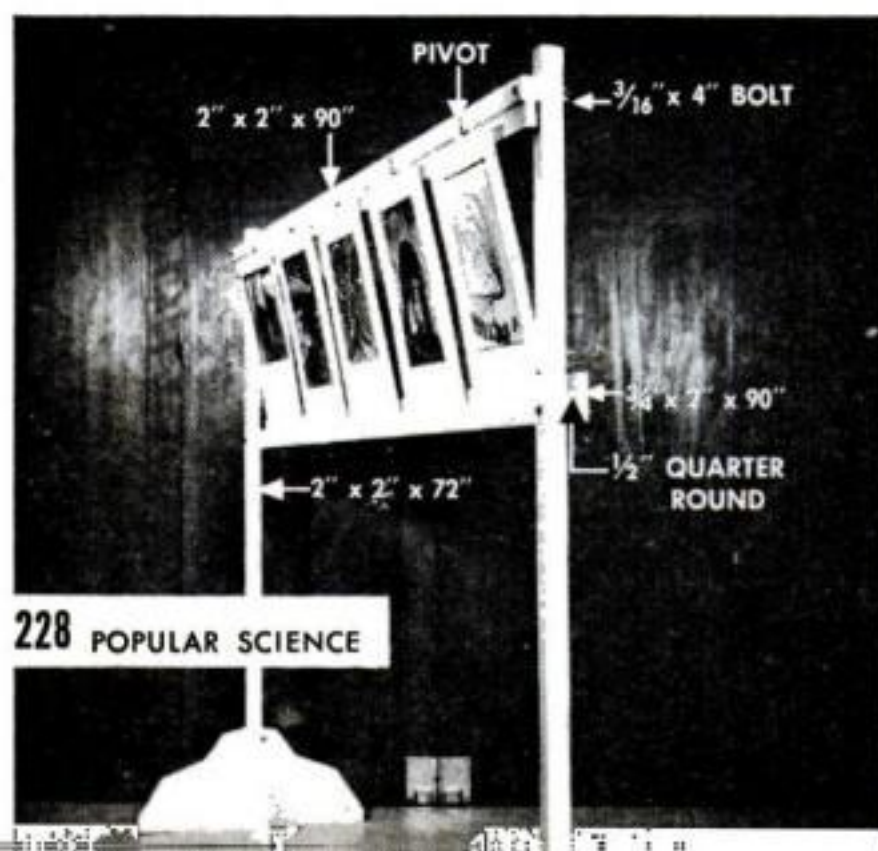
SOME photographers have long been dissatisfied with the old light-box method of exhibiting prints for salon judging. Unless prints are made especially for viewing in such light, they're apt to appear too harsh—and therefore unacceptable.

The display stand shown here is intended

to solve this problem. Designed and built by Otto Litzel, of New York, it offers a good project for a camera club.

Glarefree, even illumination is obtained by using ordinary room lights, plus two 100-watt bulbs in 9' reflector stands. The stands are placed about 10' forward of the easel, one on each side. Prints are held at a 10-deg. forward tilt, eliminating all glare from the overhead lights.

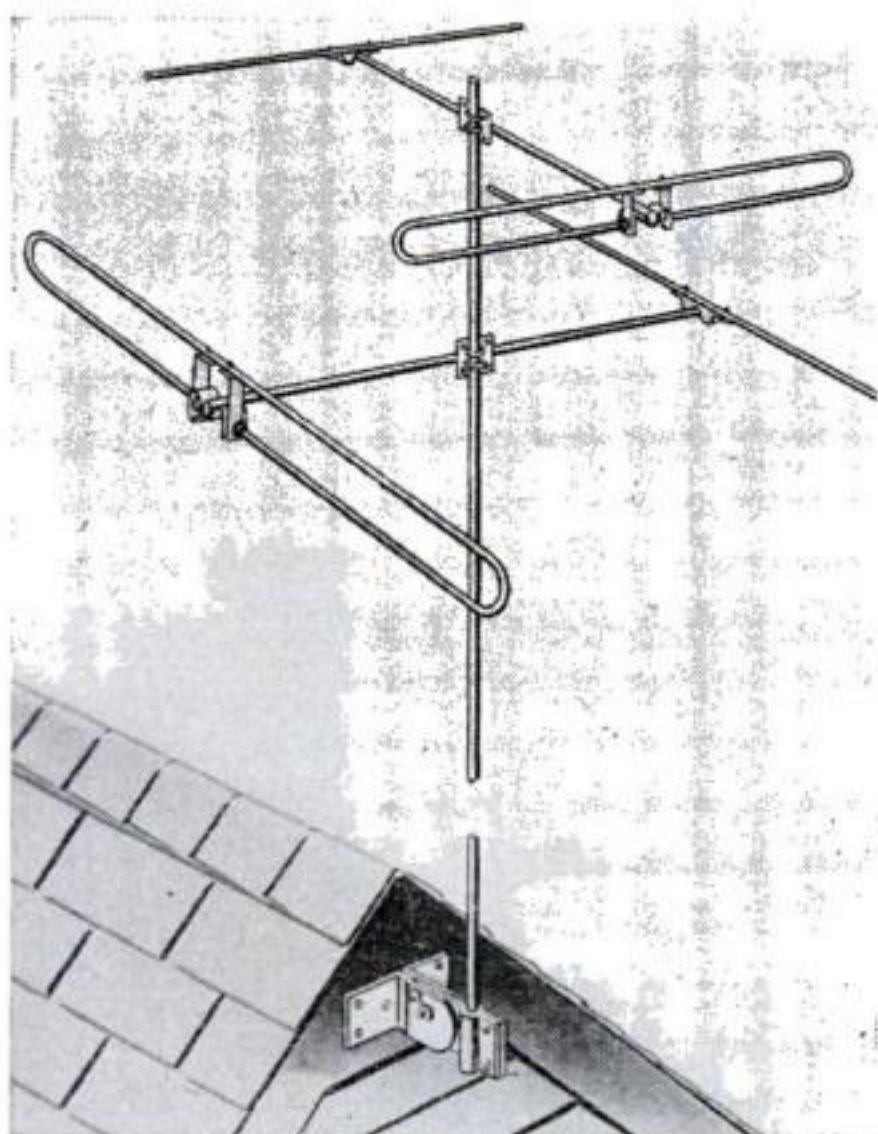
Wing nuts allow the easel to be taken apart for storage when it's not in use.



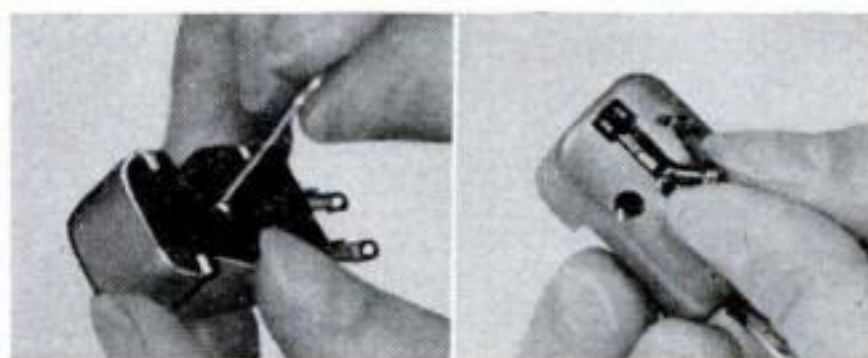


Projector Changes Slides. Semi-animation and a large degree of program continuity in slide-film showings are made possible by the new Soundview® projector sold by Automatic Projection Corporation, New York. At the time the film and sound track are made, a high-frequency—7 kc.—

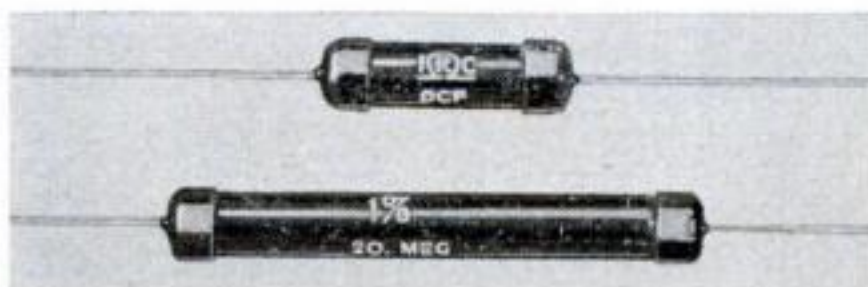
tone is recorded on the disk at each point where a picture change is desired. This virtually inaudible sound triggers the slide-change mechanism. Stray tones can't trip the picture because the machine responds only if the note is of proper duration and amplitude as well as frequency.



Antennas Meet Local Needs. A new line of TV and FM antennas packaged by the L.S. Brach Mfg. Corp., Newark, N. J., eases the serviceman's work. The installer brings a flexible kit of parts to the job. Using a standard base mount and mast, he can add any combination of elements in any array to suit local conditions.



Stylus Is Replaceable. New GE variable-reluctance phono cartridges feature changeable needles. When the old stylus is damaged or worn, it can be pushed out and a new one inserted. In older models the entire cartridge had to be replaced. Styluses are still of the permanent type, good for thousands of plays.



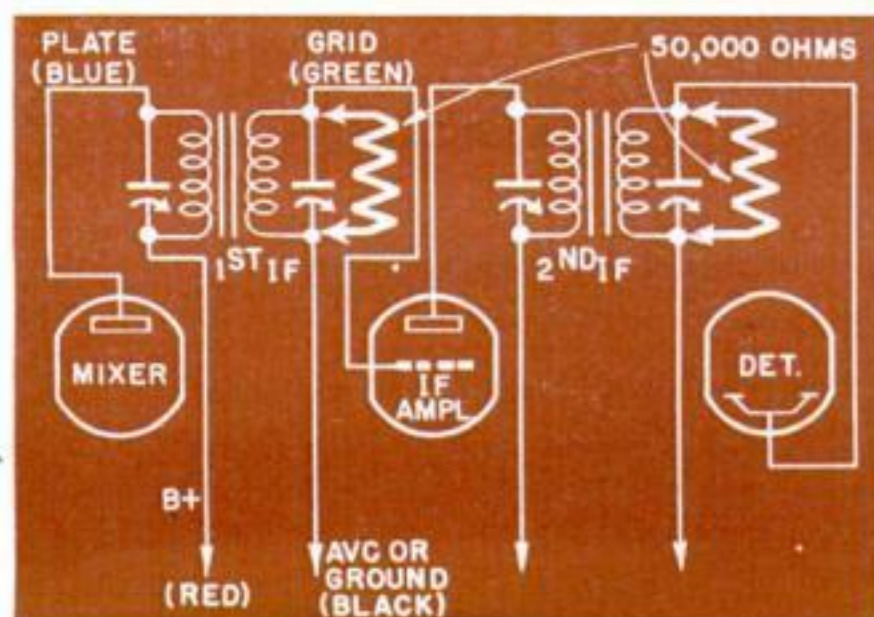
Deposited Carbon Resistors. To combine economy and close tolerance, International Resistance Co., Philadelphia, makes these resistors by depositing crystalline carbon film on ceramic rods. The new units are made in 1- and 2-watt ratings, 1-, 2-, and 5-percent tolerances, and a broad range of resistance values.

Getting Big-Set Quality from a Midget

By Joseph Saldana



A speaker cabinet helps you get full console sound quality from the modified midget on top.



1. Loading the secondary of an IF transformer with a resistor helps to broaden its response.

LIKE the legendary cobbler whose children went without shoes, I'm a radio engineer who has never owned a good receiver. A few months ago I grew tired of listening to the tinny squawks that came out of my little AC-DC midget, and decided that I wanted something better. That could have meant an investment of a couple of hundred dollars in a high-fidelity console or the expenditure of a lot of time—and money—in building an equivalent set from scratch.

I decided against both courses. Instead I modified my small set for better reception. Since then I have made similar changes in several other superhet midgets, always with remarkable improvement in tone. Deep bass notes which had been almost inaudible can now be heard in correct balance; high flute and triangle sounds come alive during symphonic broadcasts; and the entire response is smoother and has no harsh peaks.

Feeling that I could work better if I attacked the problem systematically, I broke the receiver into four sections. Ignoring the RF stage in each case, I began with the IF. The objective here is to increase the band-pass characteristics of the intermediate-frequency transformers and thus bring up the high-frequency response. There are at least three approaches to this, and which one you choose is a matter of convenience and cost:

1. Replace the IF transformers in the set with a pair of broad-band units. These may be purchased for about \$3.

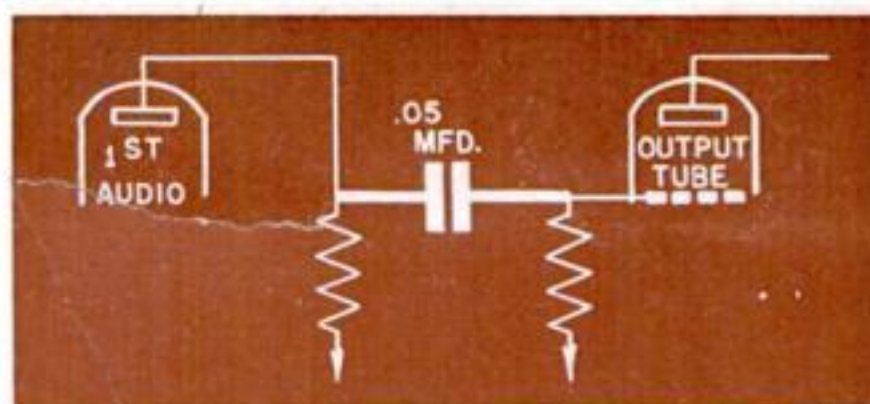
2. Load the secondary windings of both transformers with 50,000-ohm, $\frac{1}{4}$ -watt resistors. These are connected from the grid to ground or AVC terminals as shown in Fig. 1.

3. If it is convenient to open the IF cans, move the windings about $\frac{1}{4}$ " closer together, as illustrated in Fig. 2. This increases the

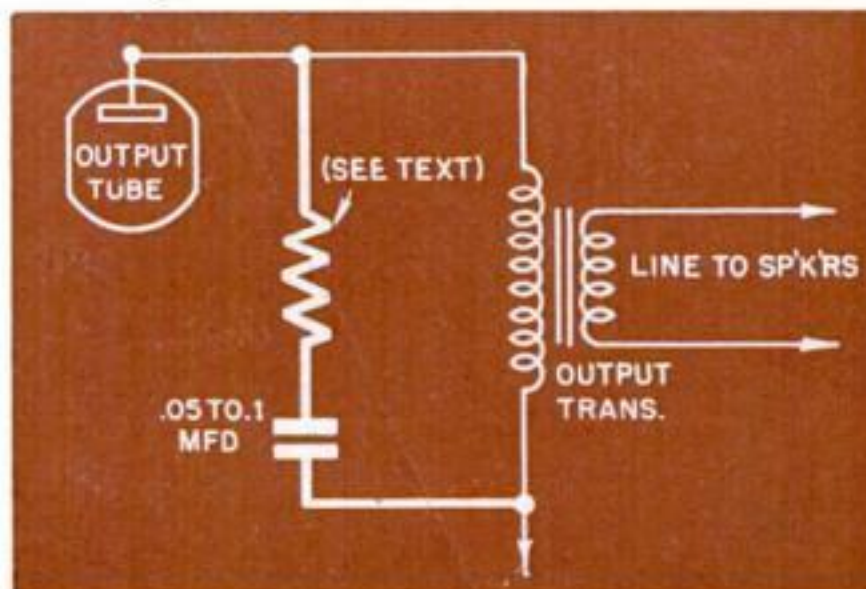
coupling and broadens the resonance peak. Take great pains not to damage the delicate wires. Heating the coil to soften the wax coating makes it easier and less hazardous to move the windings.

The next portion of the set to consider is the audio amplifier. Because manufacturers are anxious to keep hum level low, they usually use low values of coupling condensers in midget sets. These, in turn, limit the low-frequency response of the audio section. I substituted .05-mfd. coupling condensers in this section. A typical position for one of these capacitors is diagrammed in Fig. 3. In sets using single pentode or beam-power output tubes, an R-C (resistance-capacitance) filter can be used to advantage to smooth the high-frequency end. A resistor and condenser in series are connected across the primary of the output transformer (Fig. 4). This puts a more constant load on the output tube in the middle and upper frequencies, and thus improves the response. The resistor should be 1.3 times the value of the output tube's rated load resistance. You can check this figure by looking up your particular tube in a tube manual. The condenser may vary from .05 to 1 mfd.

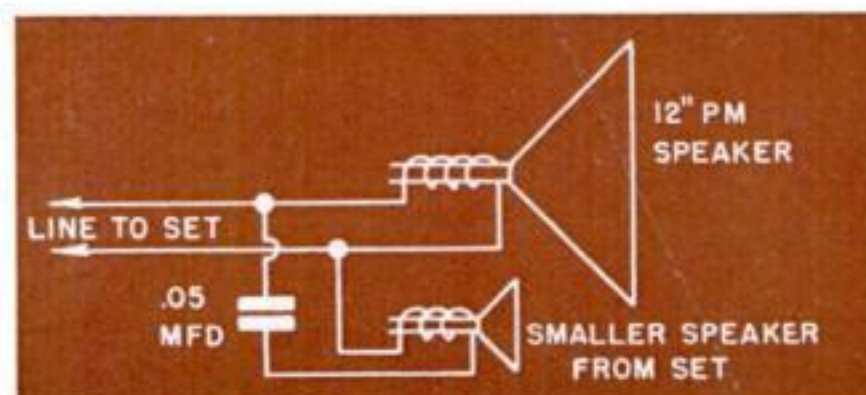
The third section to be attended to is the speaker system. Most midgets have 4" to 6" speakers that can't do much in the way of bringing out low notes but which can be used as tweeters or high-frequency reproducers. By purchasing a 12" speaker and connecting it in parallel with the one in the set, I had an effective woofer-tweeter combination. There are many more elaborate



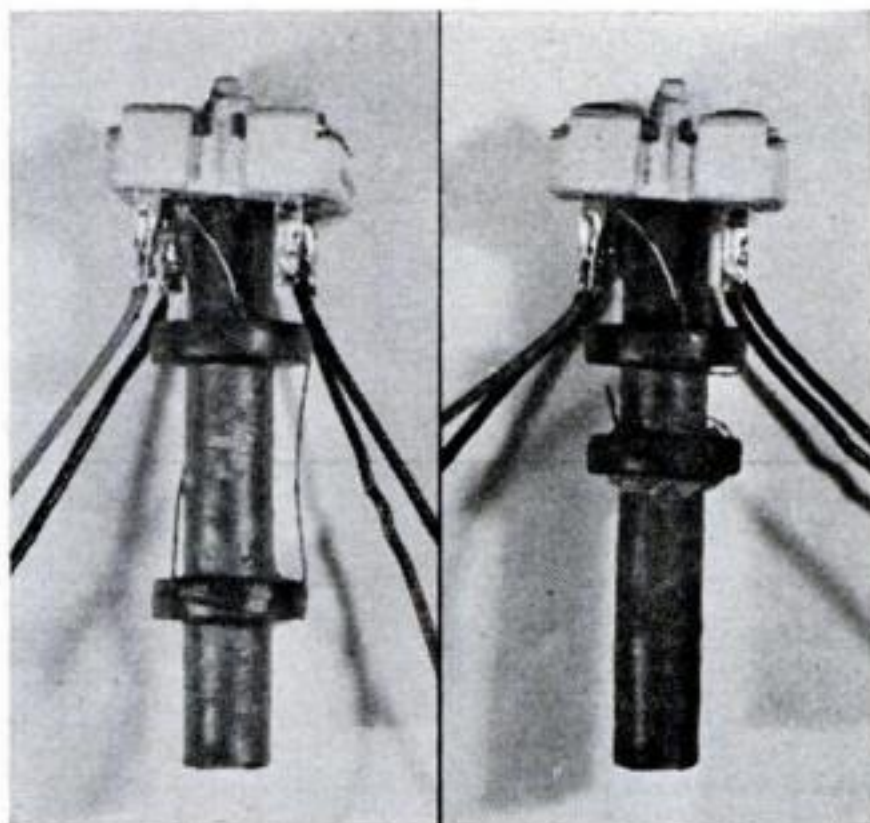
3. Bass is increased by changing the coupling condensers to .05 mfd. in the audio section.



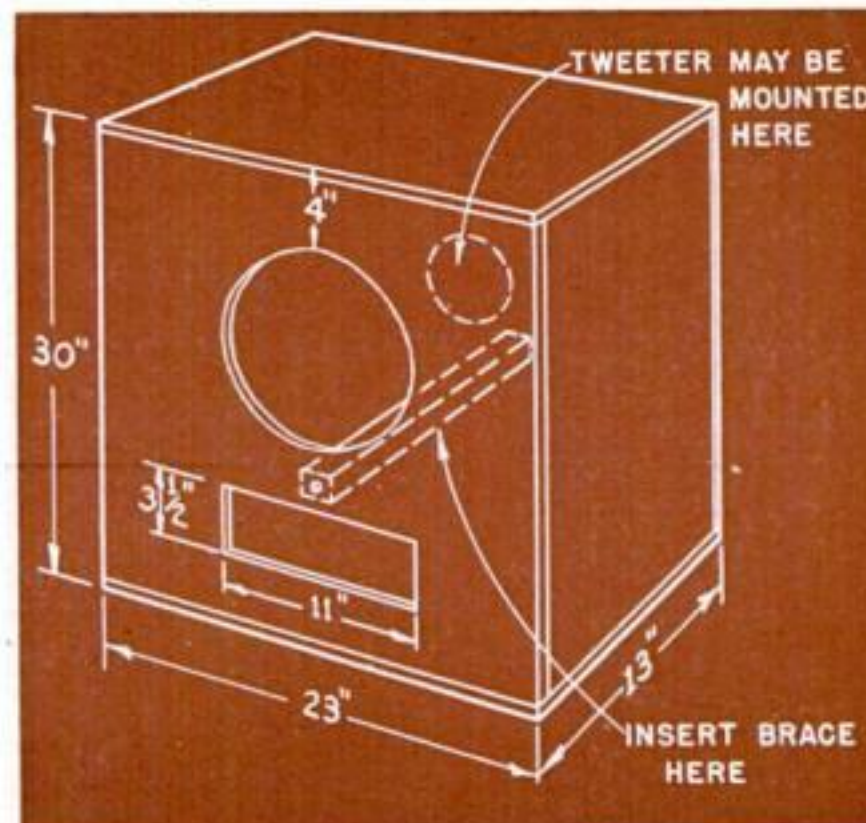
4. An R-C filter shunted across the primary of the output transformer smooths the response.



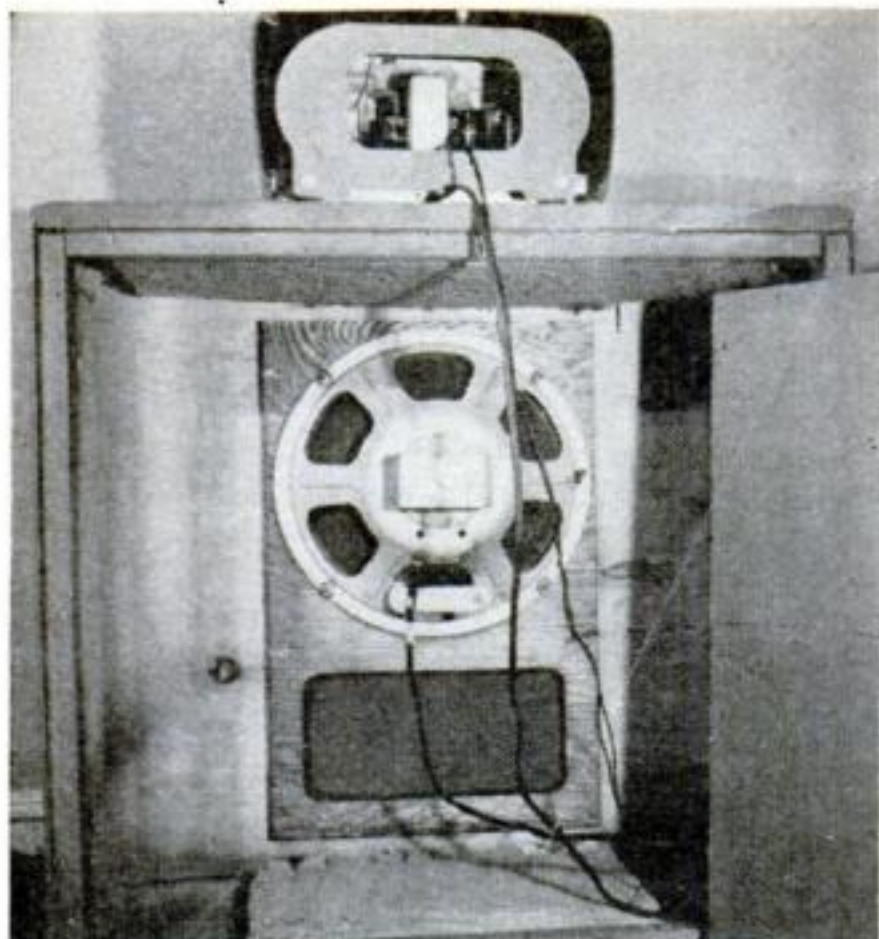
5. Use the original speaker as a tweeter and add a 12" woofer. A condenser divides the two.



2. The original IF coil (left, can removed) can be modified by moving the windings closer.



6. A bass-reflex cabinet for a 12" speaker may be made to these dimensions. Use $\frac{3}{4}$ " plywood.

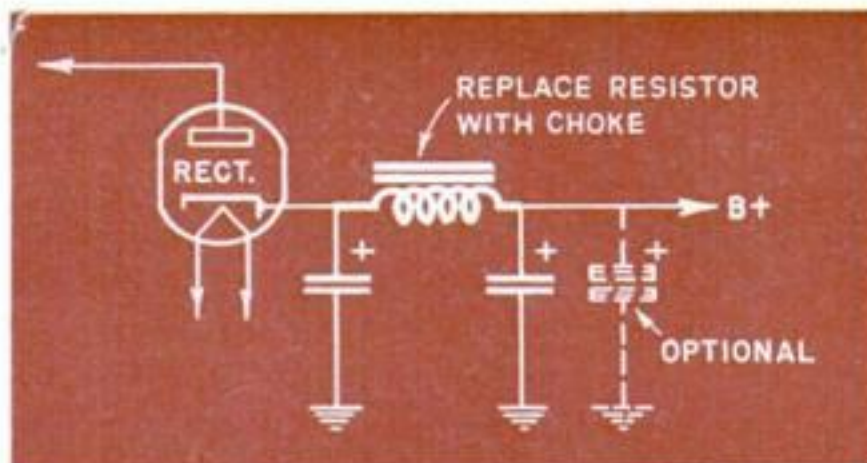


7. A commercial speaker cabinet seen from the rear. Set and small speaker are used near it.

divider networks and speaker systems possible (one is described on page 233) but for my setup I found it sufficient to insert a single .05-mfd. condenser as shown in Fig. 5 to keep low frequencies from getting through to the tweeter.

Cost is an important factor in the next decision. I purchased a bass-reflex cabinet to house my new 12" speaker. You can do likewise, or build one to the measurements shown in Fig. 6. There are decided advantages to such a cabinet, since it gives extended bass reproduction without the annoying booming often encountered in other types of baffle. But also bear in mind that there are some very good sets that do not use speaker cabinets.

The tweeter may be mounted inside the speaker cabinet at approximately the point

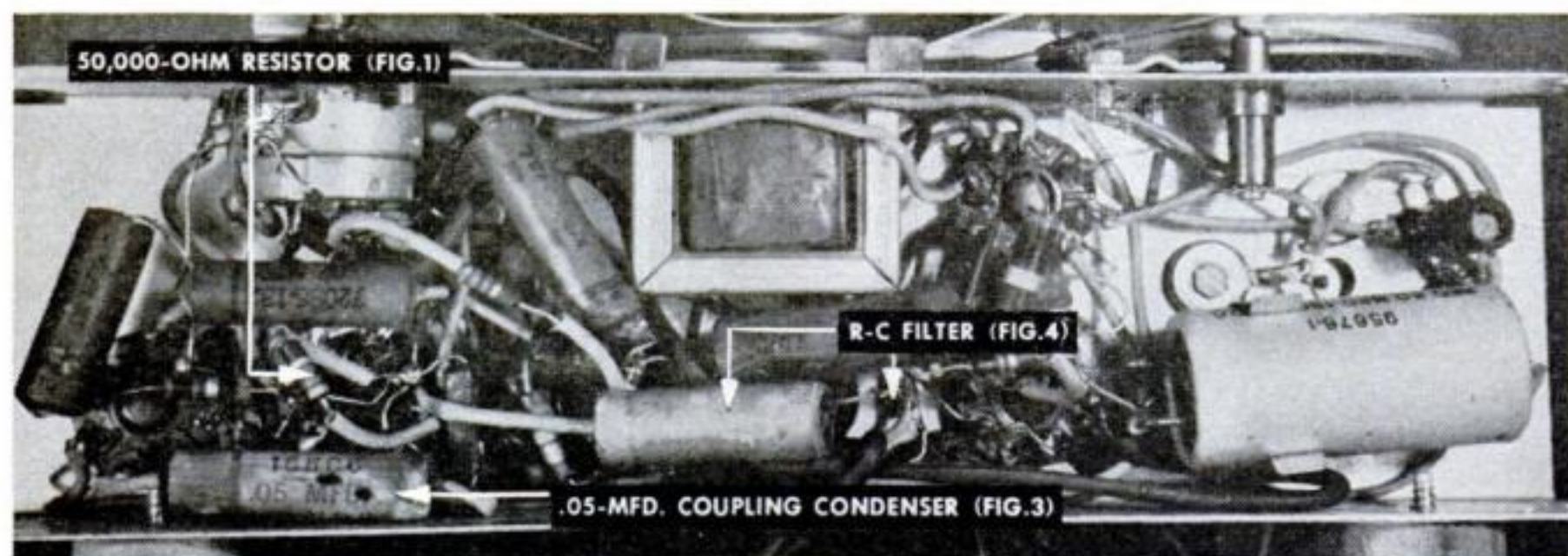


8. Hum level is raised by some of the changes, so a new choke is inserted in the filter circuit.

shown in the drawing, or it may be left in the original cabinet if the two units are going to be kept fairly close together during operation (Fig. 7). Bass-reflex cabinets must be thoroughly enclosed on all sides. To prevent the back from rattling due to sound pressure inside the box, attach a sturdy brace to front and back as indicated by the dotted lines in Fig. 6. Line the cabinet with cotton batting or other sound-absorbing material.

Having completed the modification of the signal circuits, I found that I had worked myself into an additional job. By bringing up low-frequency response, I had also brought up the AC hum, which is in the same portion of the spectrum. In some sets I worked on, this was curable by the addition of extra filtering capacitors, but in most cases a small choke proved more useful. Remove the filter resistor (usually a 1,000-ohm, 2-watt unit) connected between the two positive terminals of the dual electrolytic, and replace it with a filter choke rated from 8 to 16 henries and 400 to 600 ohms. The higher the inductance the more thorough the hum filtering. If some hum remains, add a 20-mfd. electrolytic—rated at 150 volts or up—as shown by the broken lines in Fig. 8.

END



A typical superhet midget looks like this. Some of the modifications are shown by arrows.

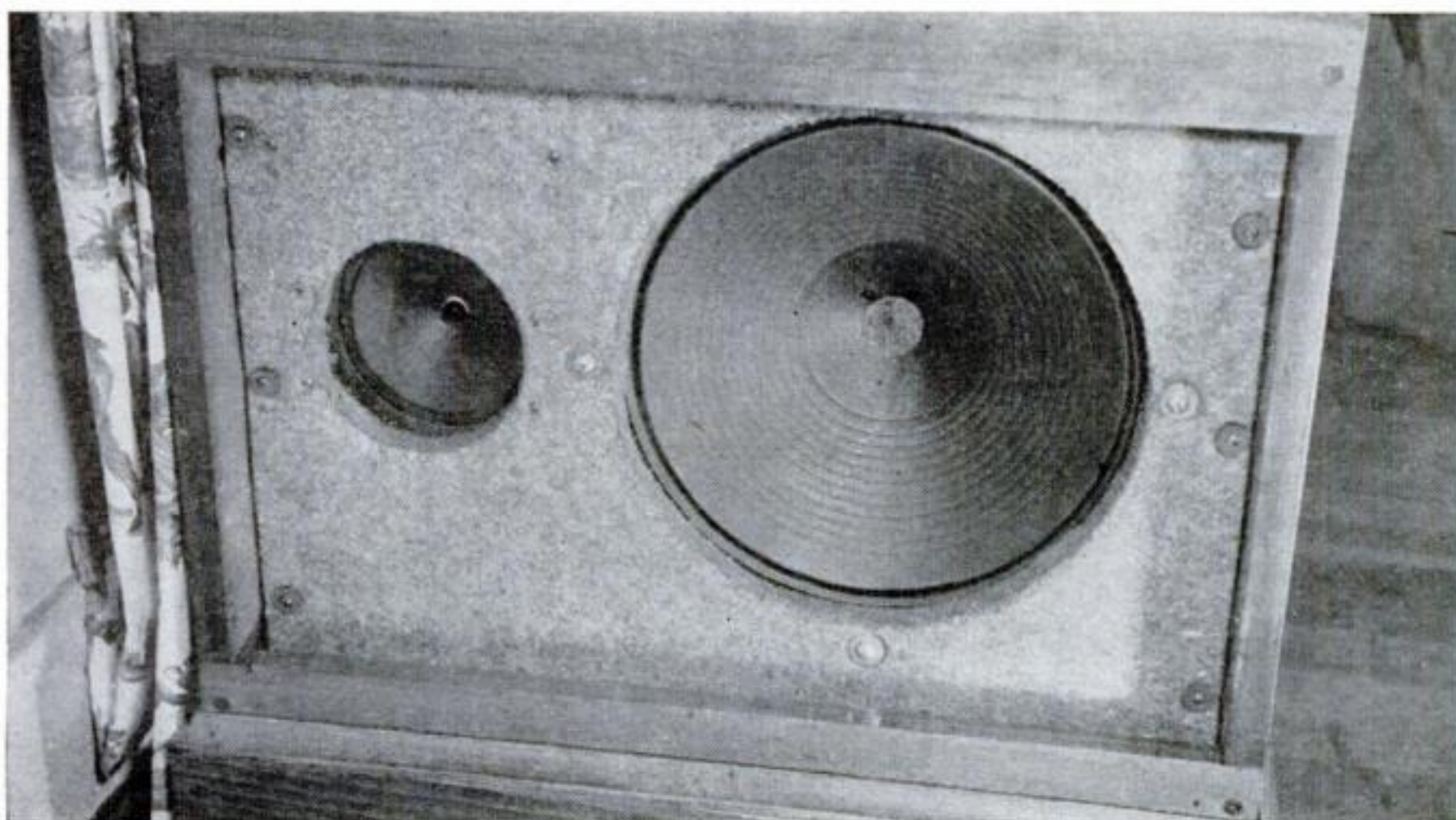
Bring Out High Notes with a Tweeter

IS THE loudspeaker bottlenecking your radio-phonograph? It is if you have a good audio system feeding into a single speaker. For no matter how much sound quality reaches the plate of the output tube, you'll only hear what the speaker can reproduce.

Single speakers are found in the overwhelming bulk of all radios and phonographs. For the most part they give adequate sound reproduction, but in many cases they do not deliver the full potential of the rest of the equipment—particularly with FM and the new wide-range records and pickups. The larger speakers—those

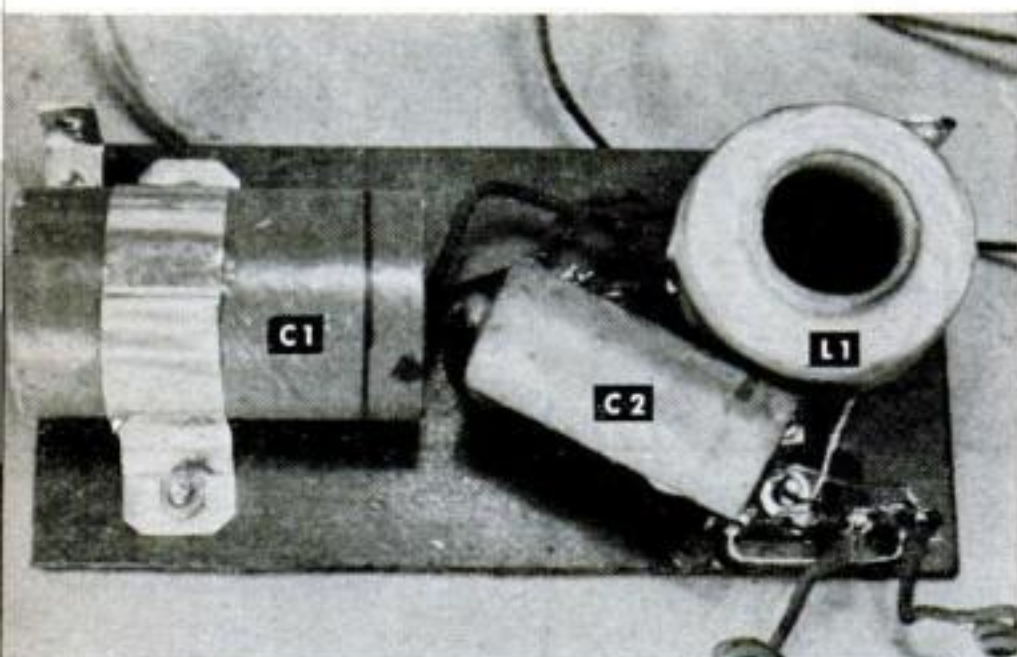


Dual speakers give you the full benefit of a well designed cabinet and a quality amplifier.

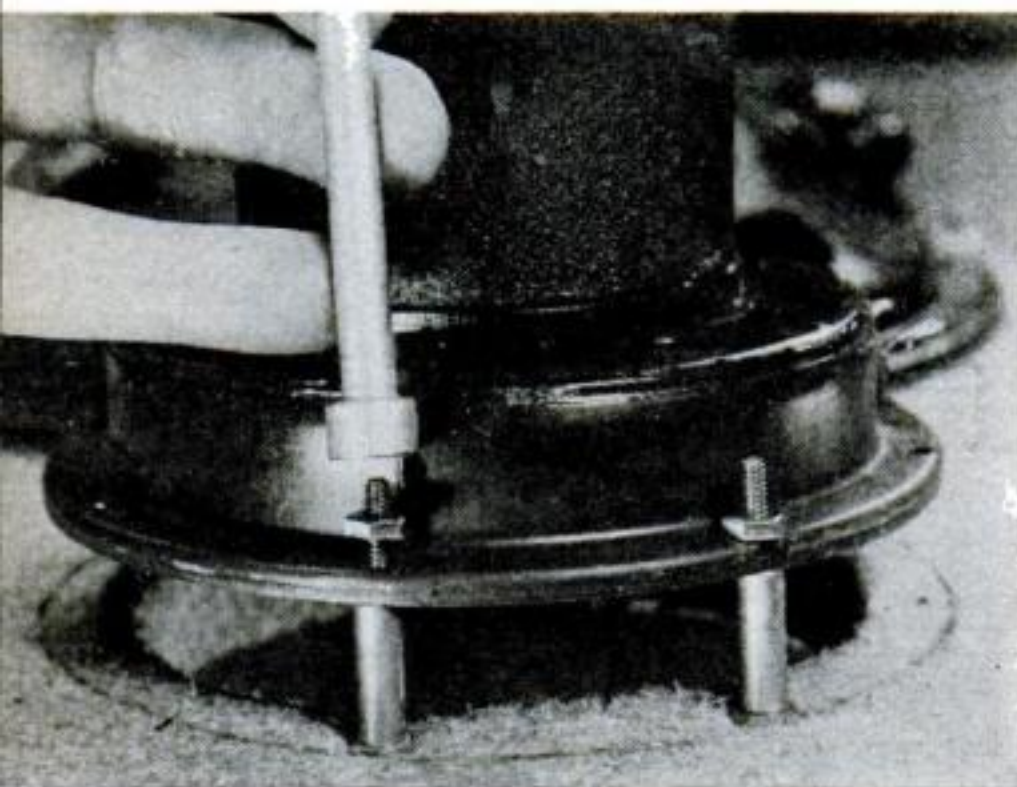


Speakers are mounted behind openings cut in a baffle made of soft fiber board. They are then

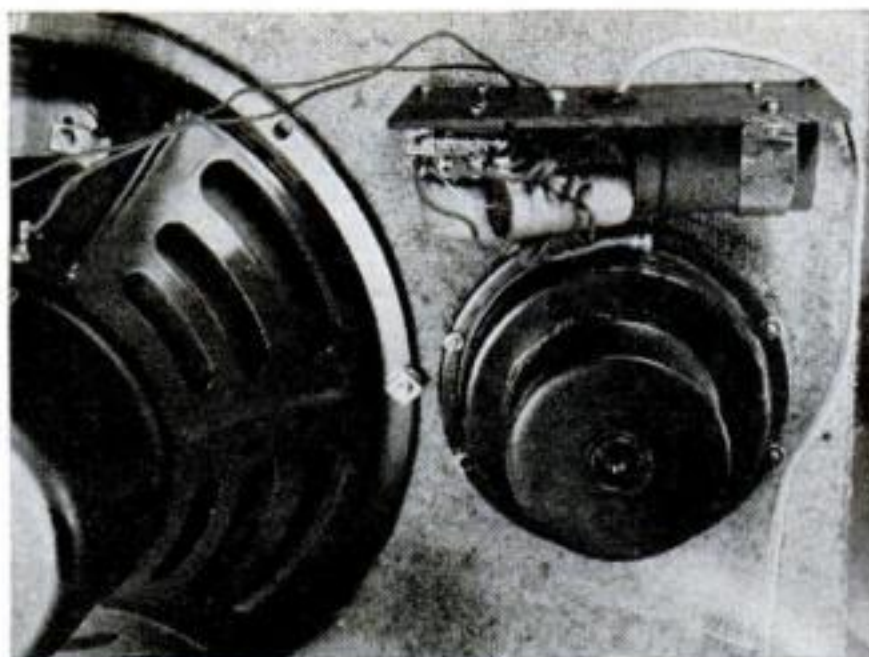
covered by a grille cloth. The tweeter may be placed on either side or above the large unit.



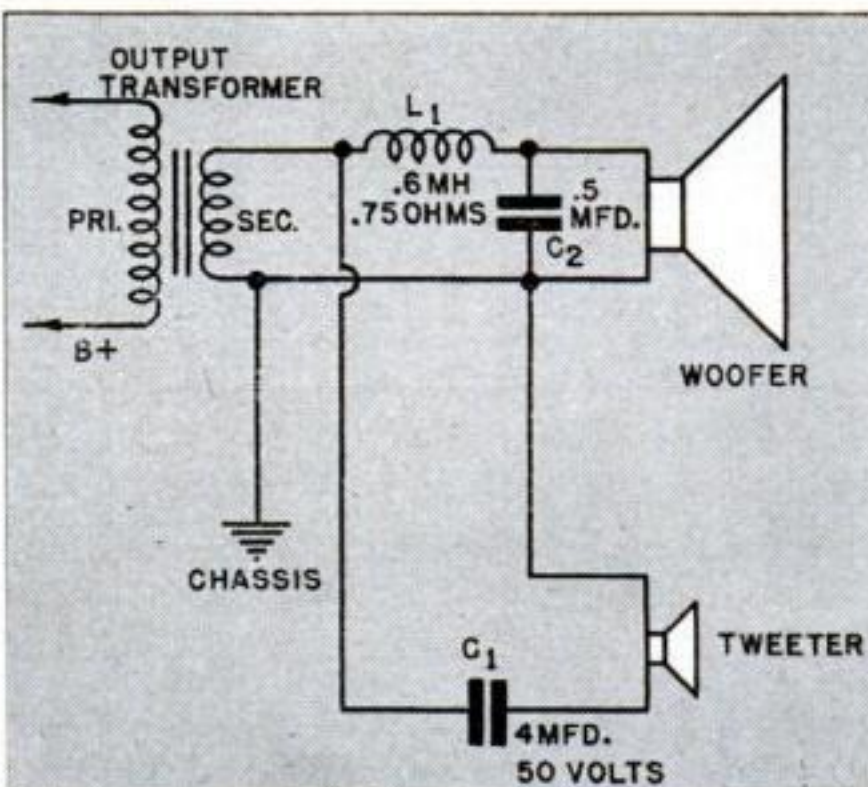
The divider network consists of two condensers and an RF choke, mounted on an insulating strip.



Spacing the tweeter on four 1" metal collars minimizes reproduction of low-frequency notes.



Place the speakers side by side on the baffle. The filter network is attached near the tweeter.



Filter circuits for tweeters may be purchased prewired, or you can make one as shown above.

with frame diameters of 8", 10", 12" or larger—are particularly good for reproducing low notes. However, while their large, free-moving cones boom out the bass well enough, they tend to muffle the high notes. To reproduce the latter sounds with fidelity, you need a tweeter.

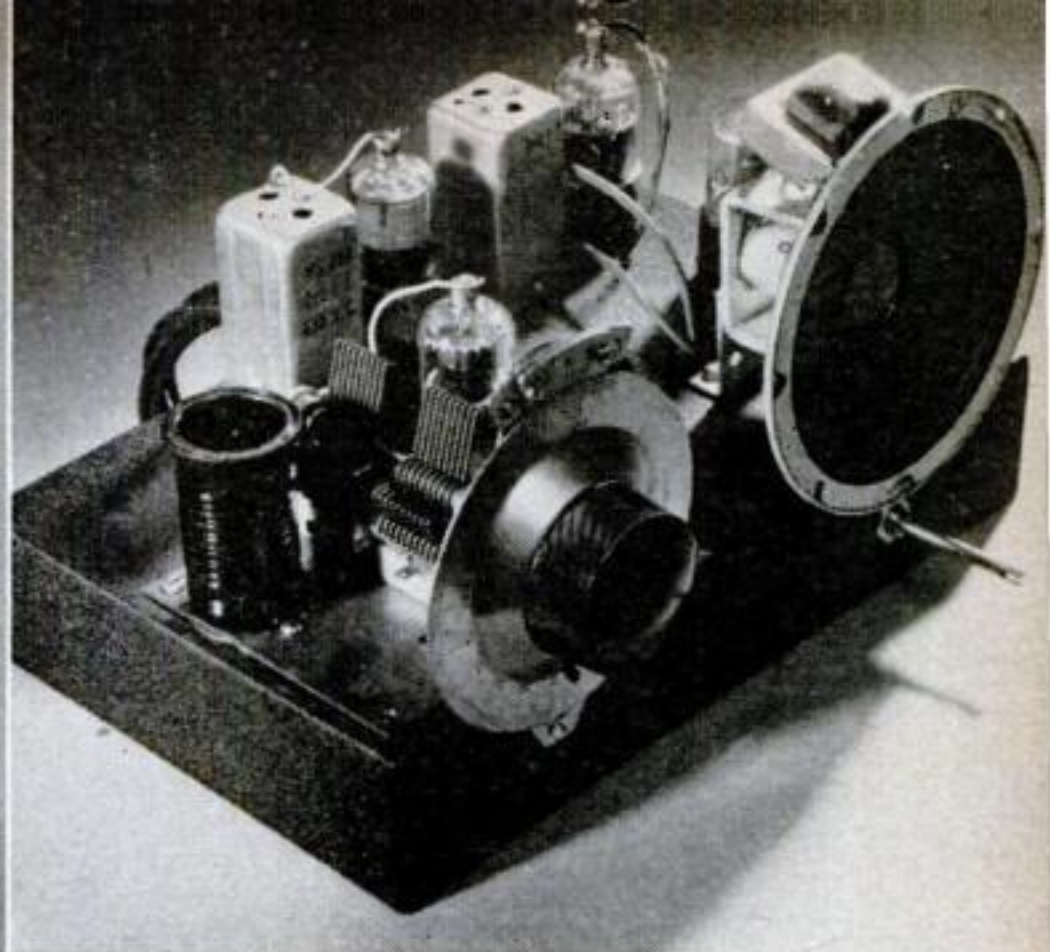
Tweeters are small, rigid-cone speakers of about 3" to 6" diameter especially designed to reproduce all or part of the sound spectrum between 2,000 and 15,000 cycles. When combined with a large speaker—or "woofer"—and a dividing network, a tweeter will give greater faithfulness and brilliance to any music. In addition to increasing the range of your sound system, it will also improve the balance between high and low notes and separate individual instruments.

You can spend from \$2 to \$25 or more on a tweeter. The one in the photos cost about \$8. It has a voice-coil impedance of

16 ohms, but in this circuit it works perfectly in combination with a standard 12" speaker having an impedance of 6-8 ohms.

The dividing network includes a .6-milli-henry, .75-ohm RF filter choke whose function is to keep high frequencies from the woofer. Low notes take an opposite path, since C1 blocks them from the tweeter while L1 passes them readily. Condenser C2 filters any stray highs that may have gotten past the choke. Note that C1 is a paper condenser, not an electrolytic.

Mount the two speakers on a fiber-board baffle. The tweeter should not be placed below the woofer; it is spaced off the board on four 1" collars to discourage the reproduction of low frequencies. To obtain fullest emphasis of low notes you may wish to try a bass-reflex cabinet. Construction details are given elsewhere in this issue.—*Frank Tobin, Manhattan, N. Y.*



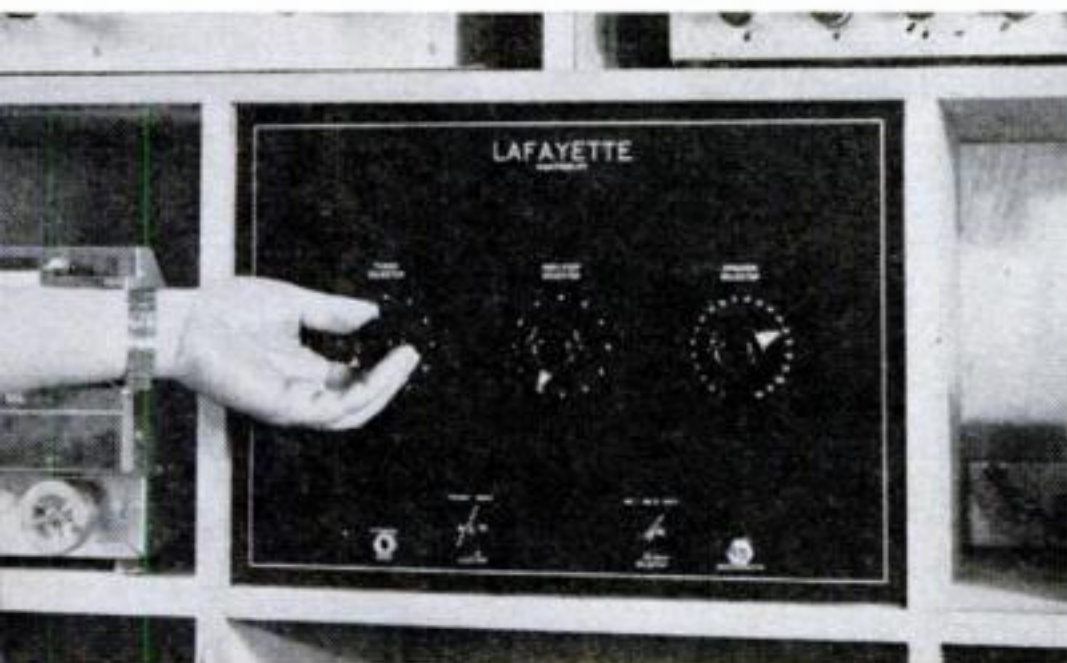
Shortwave Receiver Built on Half-Hour TV Show

STARTING from bare parts, a shortwave receiver was put together and working within 19 minutes recently while television cameras looked on. This demonstration of soldering virtuosity was performed by sound engineer Rudy Winston (left, above) on the "United Nations' Casebook", a regular program on New York's WCBS-TV. To save building a rectifier stage in his race against the clock, Winston used battery power. The completed four-tube superhet is at right above. Though the program lasted half an hour, Winston had only 25 minutes, as the script called for

a view of the parts at the beginning and a demonstration of the receiver's performance at the end. By practising assembly in advance, Winston had the set bringing in overseas stations with six minutes to spare.

Purpose of the stunt was to dramatize one of the world's greatest needs—inexpensive, sturdy shortwave receivers. PS Editor Perry Githens, on the same program, showed charts indicating the terrific scarcity of receiving sets in countries where news and information of the United Nations should be made available.

Radio Selector Gives 145,000 Sound Combinations



PROSPECTIVE purchasers of radio-phonographs can now compare basic units to the tune of more than 145,000 combinations. Lafayette-Concord Radio, New York, recently opened the demonstration room partly shown at the right above. Racks containing 12 record players and changers, 12 FM, AM, or combination tuners, 48 amplifiers,

and 21 speakers are arranged and wired so that any individual item can be joined with any other. Complete assemblies, less cabinets, are available from \$75 to \$1,000 or more; speakers alone range from an 8" unit selling for under \$9 to a 15" one at \$310. Four interconnected control panels of the type pictured take care of the switching.

Love, String, and Sealing Wax

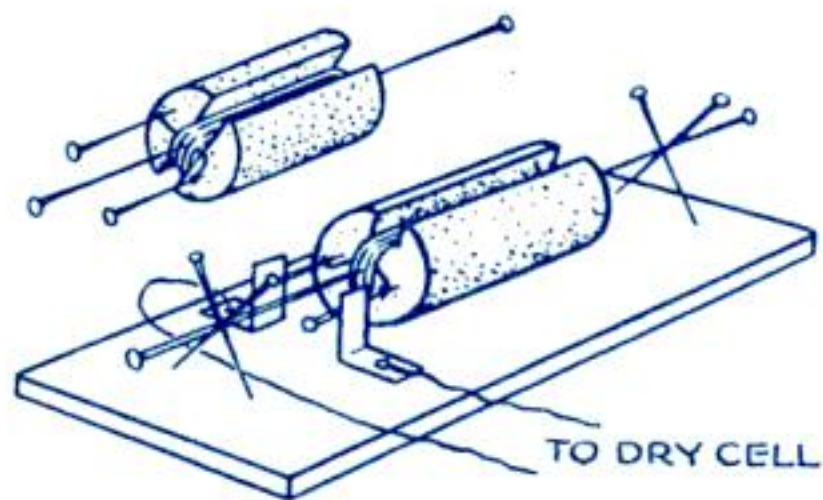
UNESCO booklet shows teachers in devastated countries how

COSTLY, complicated equipment has its place in a modern laboratory, but brilliant scientific discoveries have been made without it. Archimedes and Galileo, for example, did fine with just simple things. And commonplace materials are all you need to teach your youngsters basic science.

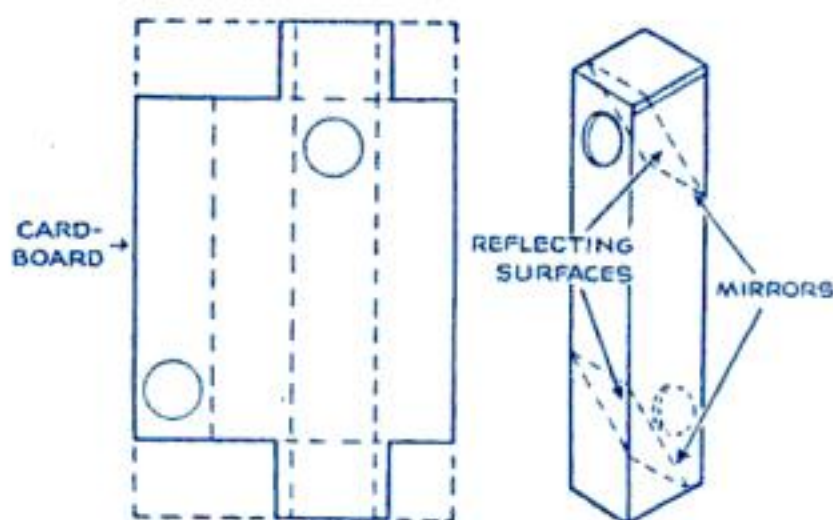
Sometimes modern scientists question the trend toward ever-fancier lab equipment. The title above is based on a phrase in a

lighthearted song called "Take Away Your Billion Dollars," written by Arthur Roberts, an American physicist. The song's main point: ideas come first, equipment second. You *can* get along with simple things.

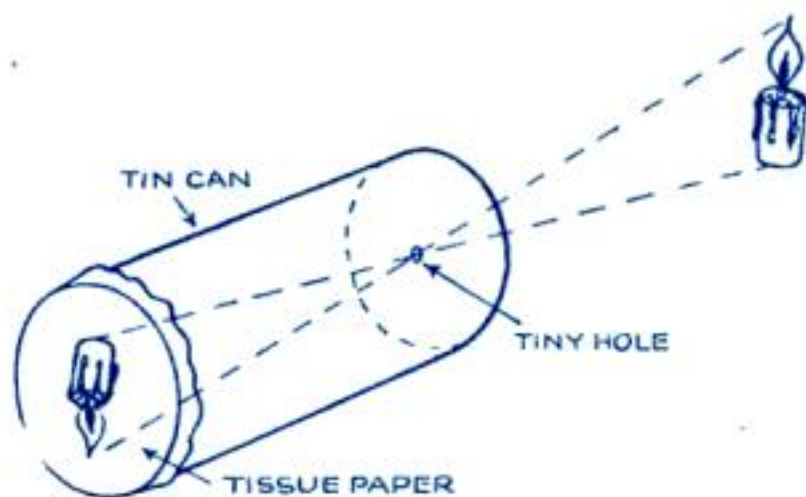
This is also the theme of a booklet prepared by the United Nations for teachers in war-devastated countries. On these pages are some of the experiments it suggests. All drawings were adapted from the booklet.



Electric Motor. You can make one with a horseshoe magnet, a cork, a few pins, and scraps of tin or copperfoil. The armature is a coil of thin insulated wire wound in a groove cut with a razor blade in the cork. The ends of the wire are wrapped around two pins that serve as the terminals through which the current enters and leaves the coil. Leads from a dry cell attached to the brushes feed power to the motor.



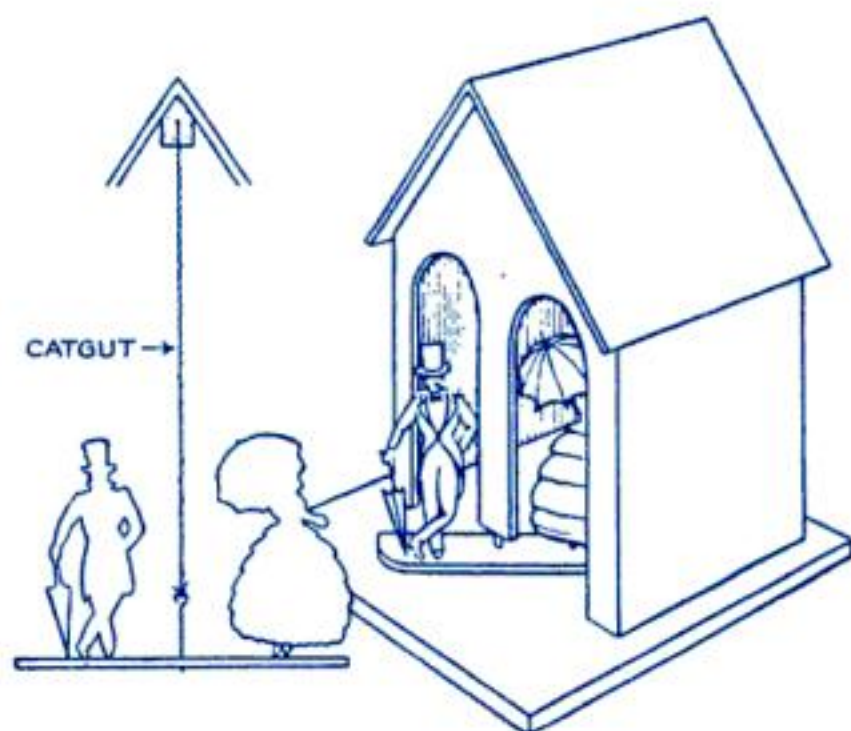
Periscope. Talk about submarines and a youngster is sure to ask: What's a periscope and how does it work? In a sub, the periscope is more elaborate than this toy, but it works exactly the same way.



Pinhole Camera. However fancy it may be, any camera is just an elaboration of that earliest picture taker—the pinhole camera. Here's one you can rig up in a couple of minutes. You'll get best results by looking at the screen in a darkened room. Keep the hole as small as possible for greatest sharpness.

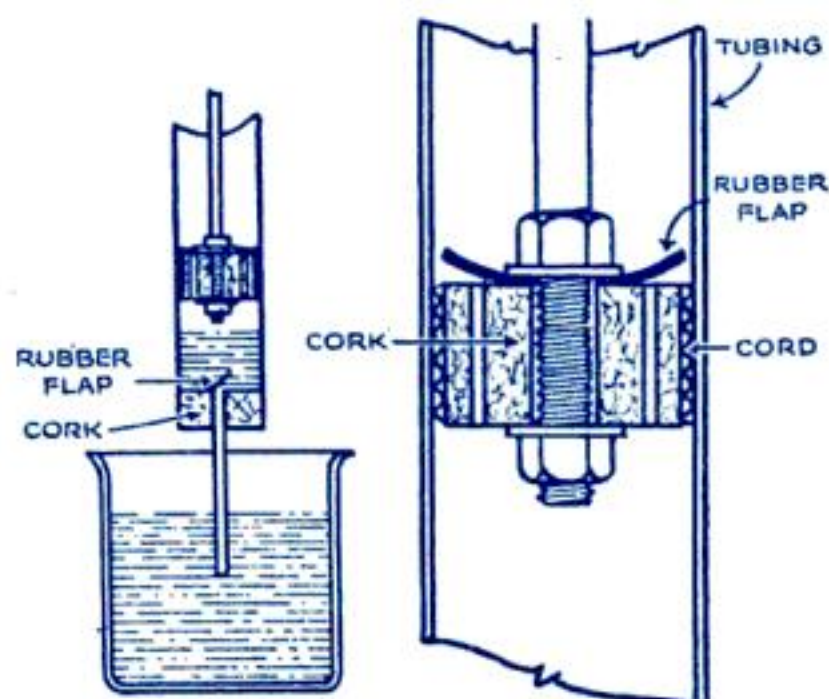
Keep Science Alive

everyday things can be used to demonstrate basic science

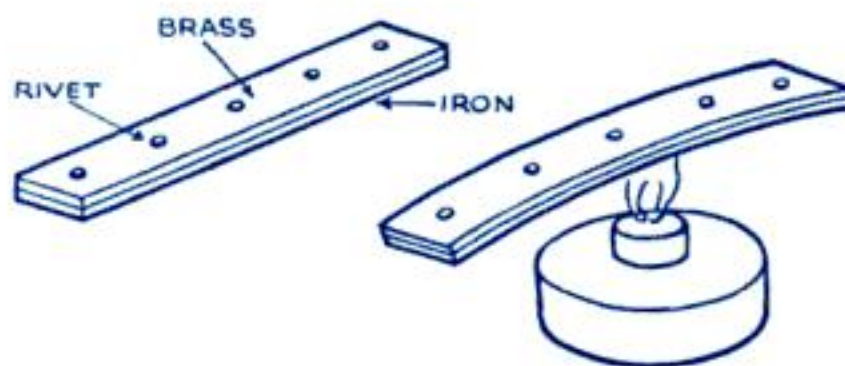


Weather House. When the atmosphere fills with water vapor, rain is in prospect. Variations in the amount of moisture present are indicated by an instrument called a hygroscope.

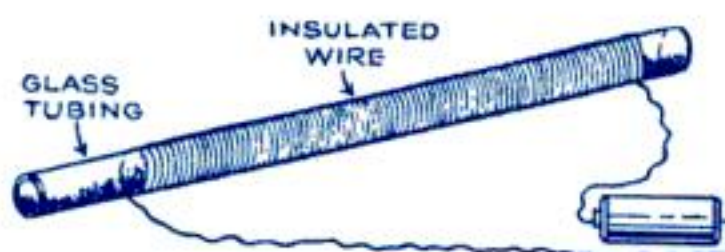
The common weather house is an example of this instrument. You can build one, using the hygroscopic properties of a piece of catgut. The direction of twist of the gut can be found by trial.



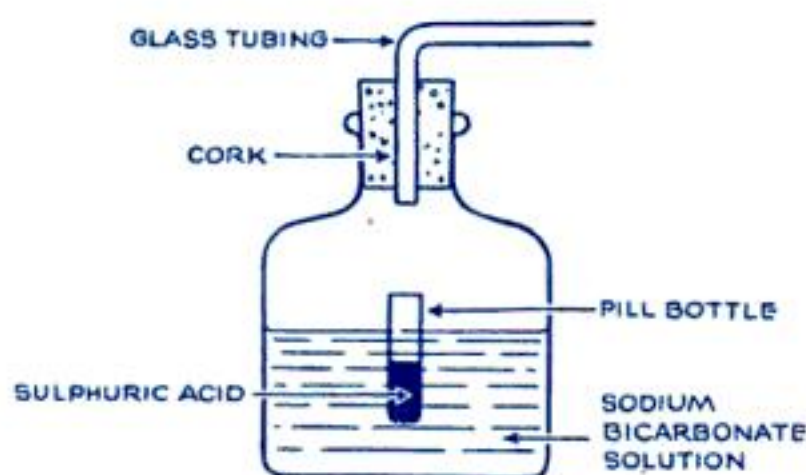
Lift Pump. Backyard wells are often topped off by this useful device. It makes use of atmospheric pressure to lift water from one level to another. How it works can be shown with this model. Burn holes through the cork with a hot wire to allow the water to pass.



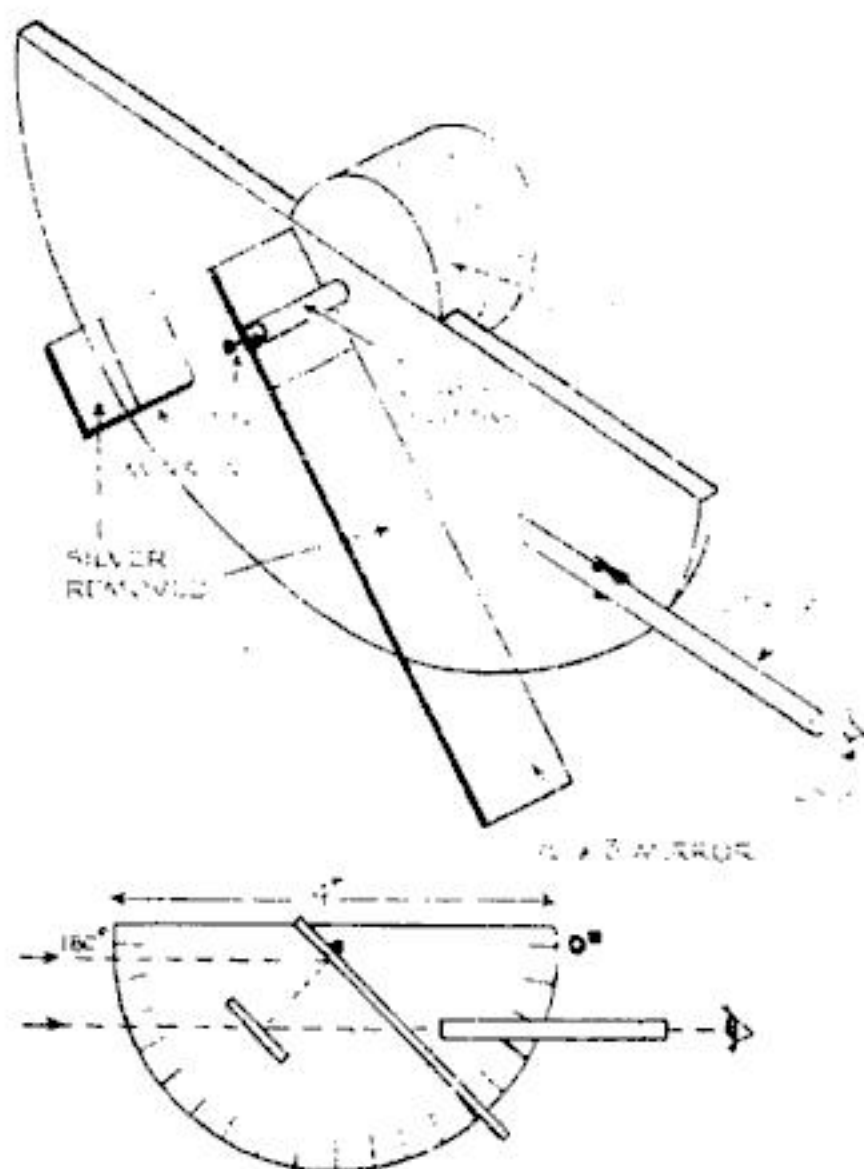
Thermostat. When heated, different metals expand at different rates. This principle actuates the common thermostat. Thin sheets of iron and brass riveted together will enable you to show how it works.



Magnetizing Coil. Magnets present a wide field for study. As a beginning, why not make your own? This coil can be used to magnetize knitting needles and other slim ferrous objects.



Fire Extinguisher. You've seen the instructions on fire extinguishers: *turn up to play*. A model extinguisher will help your youngster understand why this is necessary. Don't invert this one, however. Instead, shake the bottle vigorously to mix the sulphuric acid with the sodium bicarbonate solution. This releases carbon dioxide. Be careful not to get any of the acid on your hands or clothing.



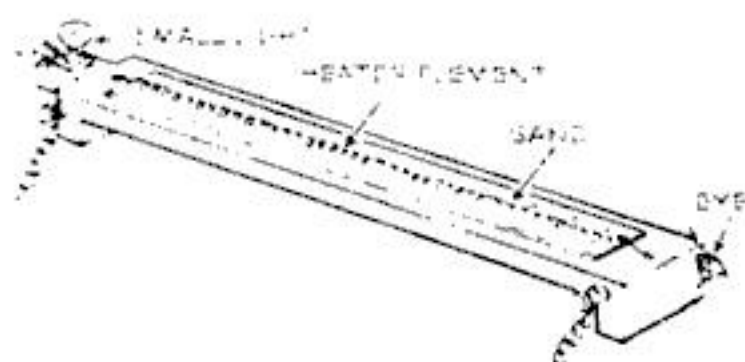
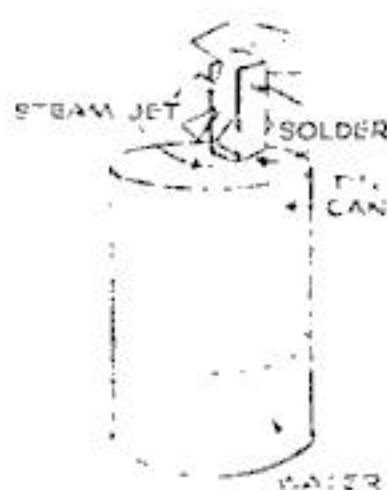
Sextant. Used by navigators to determine the altitude of the sun, this instrument is simple in principle. The graduated arc usually is limited to 60 deg. (Hence, the name sextant.) For convenience, you can use an inexpensive protractor.

Cut and fit a cork over the edge of the protractor. Stick a heavy pin through the protractor center into the cork. Remove the silvering from all except the first $\frac{1}{2}$ " of the strip of mirror. To the back of this strip, cement a piece of glass tubing that just fits on the pin. Scrape half the silvering from another small piece of mirror and fix it to the protractor at a 45-deg. angle. A drinking straw fastened parallel to the base line of the protractor makes a good sighting tube. It can be cemented in place.

To use your sextant, hold it with the cork in the right hand. Sight toward the horizon, looking through the straw and unsilvered half of the fixed mirror. Then adjust the movable mirror until the two images of the horizon form a continuous line. Record the angle indicated by the glass arm.

Now sight at the sun, using a smoked glass if necessary, and go through the same procedure. Record the angle of the arm. The angle that it has moved is half the altitude of the sun.

Turbine. This comes from a Latin word meaning that which spins or whirls around. Turbines exist in many forms. They're classified chiefly according to the motivating force; that is, water, steam, gas, and so on. You hear much about turbines these days in connection with aircraft propulsion. This model will help you show others the basic idea of how they work.

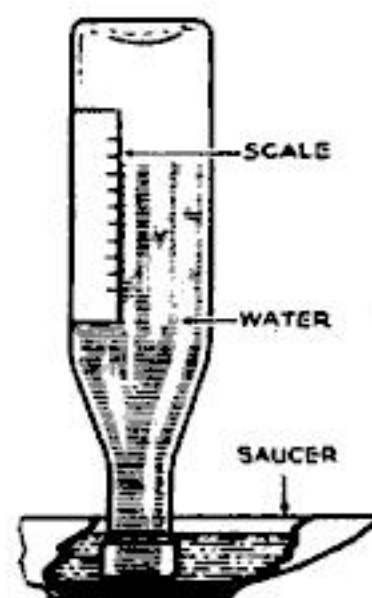


Mirage. This common optical phenomenon of the desert is produced by layers of hot air of varying density. These layers refract, or bend, light rays, enabling you to see objects at quite some distance.

The apparatus shown here will bring a mirage into your own living room. When the element is hot, an eye located in the position shown will see a reflection of the bulb in the hot air above the wire. If you wish, the wire can be completely hidden by burying it in sand, but the apparatus will then take longer to heat up.

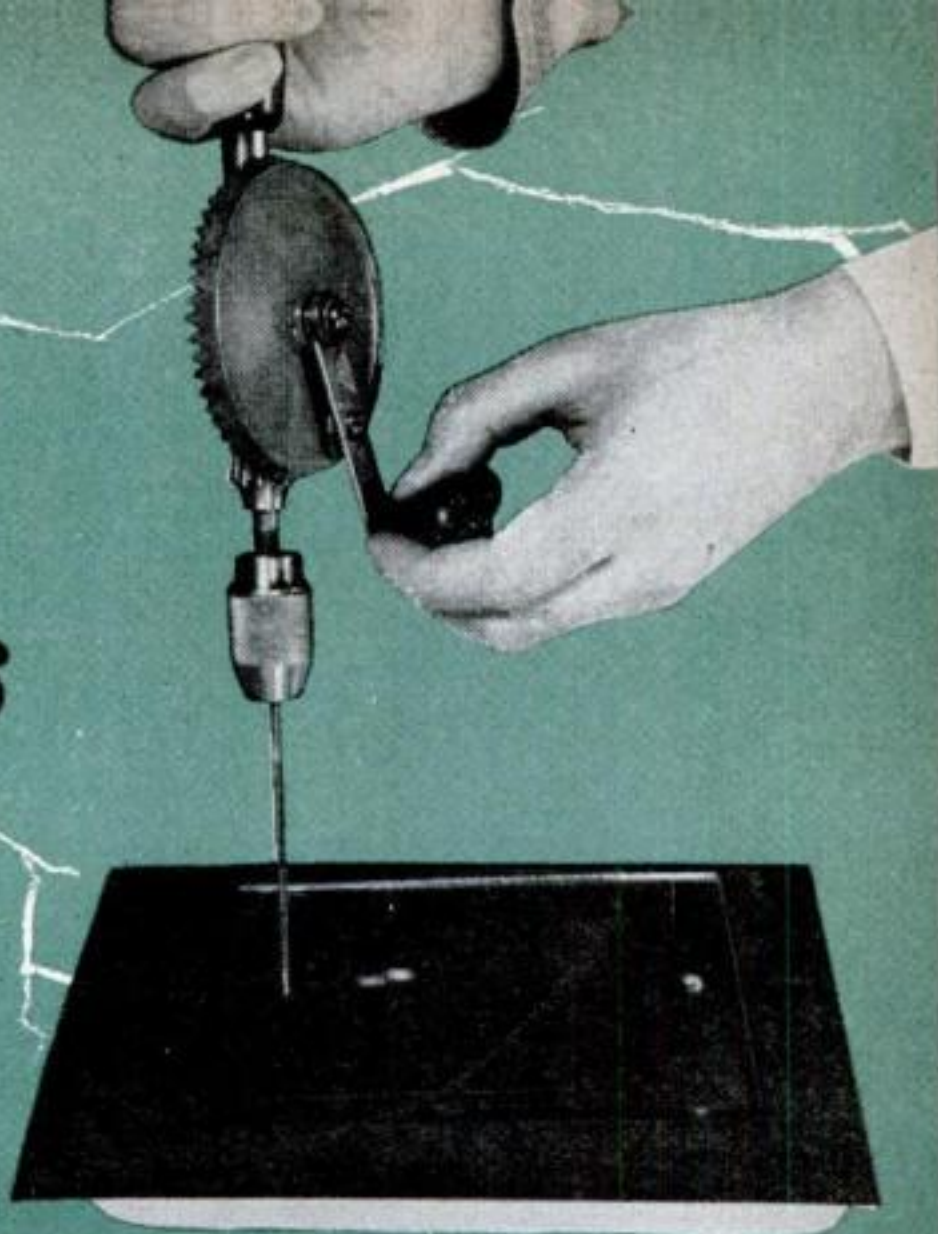
Barometer. Probable weather changes are predicted by the use of a barometer. It registers the rise and fall of atmospheric pressure.

Here's a barometer in its simplest form. Partly fill the bottle with water. Invert it with its mouth under the surface of more water in a saucer. Approximate variations in atmospheric pressure can be noted by cementing a graduated strip of paper on the outside of the bottle.



Four Ways to Drill Glass

Converting a vase or bottle into a lamp or drilling a mirror for hanging is a lot easier if you use the right tools for the work. At right a sheet of glass is drilled with a small three-cornered file.

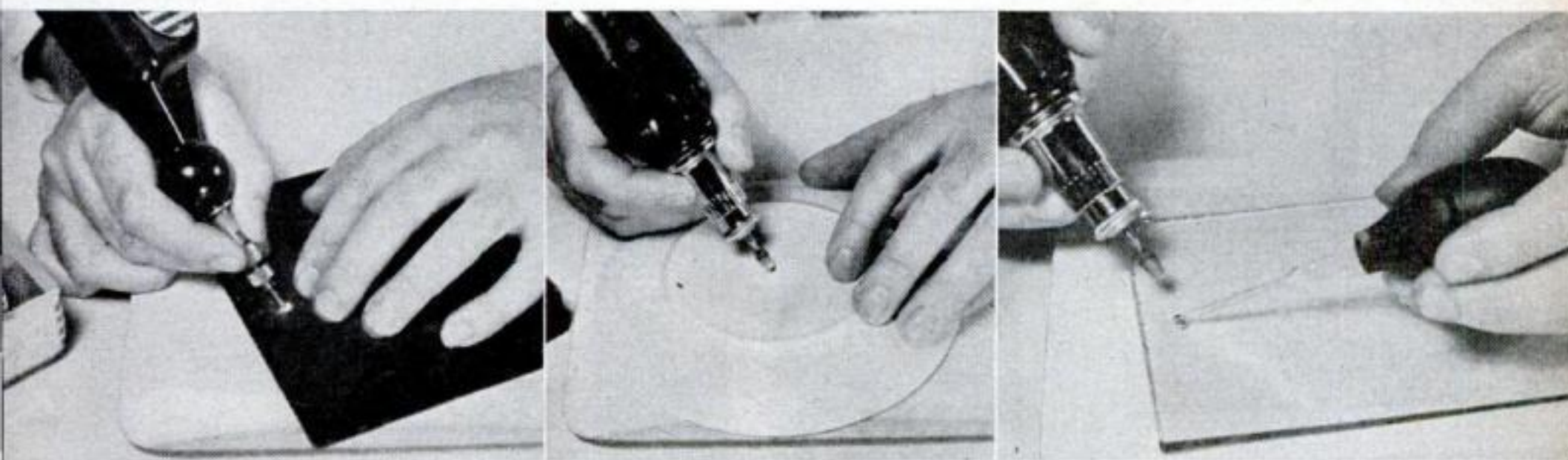


DRILLING glass or ceramics is never a cinch, but you can ease the job and keep down breakage by following the proper procedures. Of course, you can buy special bits for the purpose, but if the job turns up only occasionally, most craftsmen can get by nicely with the usual tools.

An electric vibrating or engraving tool with a diamond-point bit will drill glass but it takes a little time and patience. Don't try to use this tool on glass that's thicker than $\frac{1}{4}$ " or so. It may take from 20 to 30 minutes

to put a hole in a $\frac{3}{16}$ " piece. Use a circular motion. Don't bear down too hard on the work. Let the tool do the cutting. Guide the point in small circles first and then cut back and forth across the circle, but always return to the circular motion. Keep the sides of the hole straight or you'll find it shrinking to pin-point size. A diameter of $\frac{1}{8}$ " to $\frac{3}{16}$ " is minimum. Work the job from both sides, if you can.

The small electric hand grinders or a flexible shaft tool also will drill glass when



Three photos above show a mirror, china plate, and a pane of glass being worked. At left, an electric vibrating tool with a diamond-point bit is used to drill a mirror for hanging. Center photo shows a plate being drilled with a cone-shaped abrasive point chucked in an electric

hand grinder. Plate was used in a two-tiered pastry server. A hole was needed in the pane of glass at right to pass through a radio lead-in wire. Electric hand grinder with an abrasive point was used. The dropper feeds turpentine to the point to lubricate it.



Brass tubing and electric drill cut a hole in a glass bottle to wire it as a lamp. Putty dam around the drill holds a mixture of turpentine and abrasive powder to speed cutting.

fitted with a cone-shaped abrasive point. Lubricate the work with a little turpentine. Don't work the drill continuously. Keep the wheel running but only bear down on the glass at short intervals. Once the hole has been made, it can be enlarged by grinding away the glass around the sides.

You can also drill glass with an old three-cornered file chucked in a hand or electric drill or in a brace. Use a short file and lubricate the work with turpentine. Break off a bit of the end of the file if it rounds and softens under friction.

Then there's the old stand-by—a piece of brass tubing used in place of a bit to drill ceramics or glass. Pick a tubing that's the same outside diameter as the hole you want. Notch the drilling end of the tube with a file. Build a putty or modeling-clay dam around the spot where you'll drill and put a mixture of turpentine and abrasive powder in the dam. As the work goes along, the heat of the drilling will evaporate the turpentine. Add a little more from time to time.

If you plan to do a lot of drilling on glass or ceramics, buy one of the special drills.—*Arthur Miller, Manhattan, N. Y.*



Notch the brass tubing with a file. It speeds up the drilling. When using this method, select tubing that's the same diameter as the hole you want in the glass or ceramic.



You can drill ceramics faster since they're a lot softer than glass. Above, a vase is drilled with brass tubing to convert it into a lamp. Use turpentine and abrasive powder.

WHAT'S WRONG ?

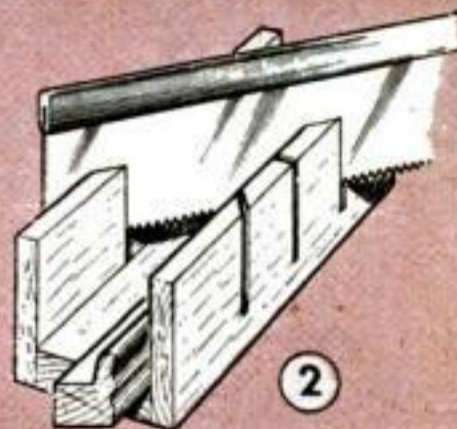
STARTING A MORTISE



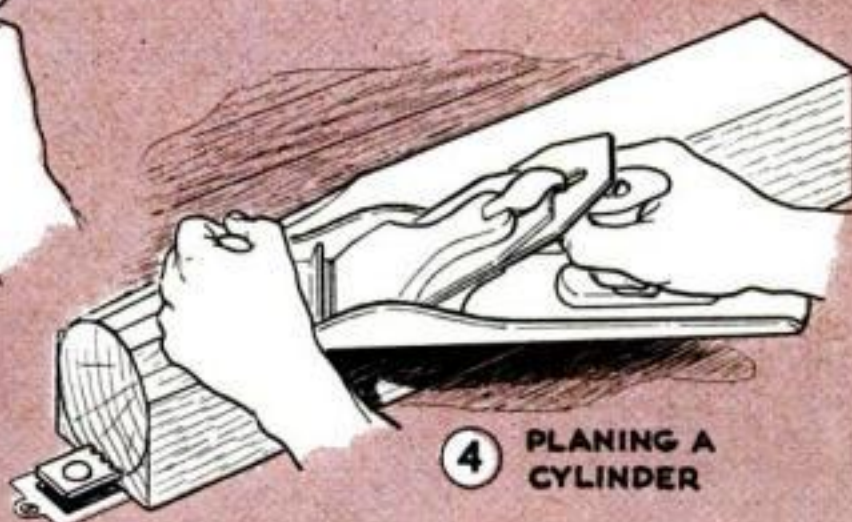
COUNTERBORING FOR BOLTHEAD



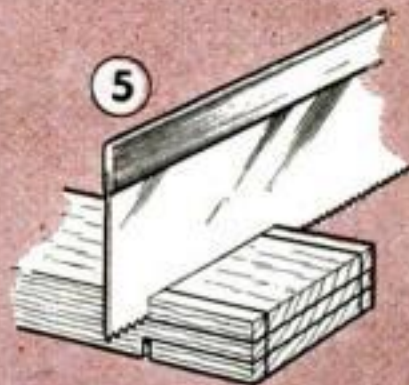
MITERING PICTURE-FRAME MOLDING



PLANING A CYLINDER



CUTTING TENON SHOULDER



WOODWORKING technique isn't just a set of rules invented by the experts in order to make things tough. There's a reason for practically every "right" and "wrong" way. Usually the right way prevents damage to the work or the tools, and does the job better. See if you can spot the errors shown here.

1. When the smaller hole is bored first, the bit has no center and may tear or scar the wood. The forethought craftsman counterbores first. If this isn't possible, use a dove centering plug on the bit.

2. The back saw cuts on the push stroke, so hold the work against the far edge of the miter box. Whenever possible a true rather than a molded edge should bear against the wall. Sawing the second miter parallel to the first will make it impossible to put the frame together. Reverse the angle of cut.

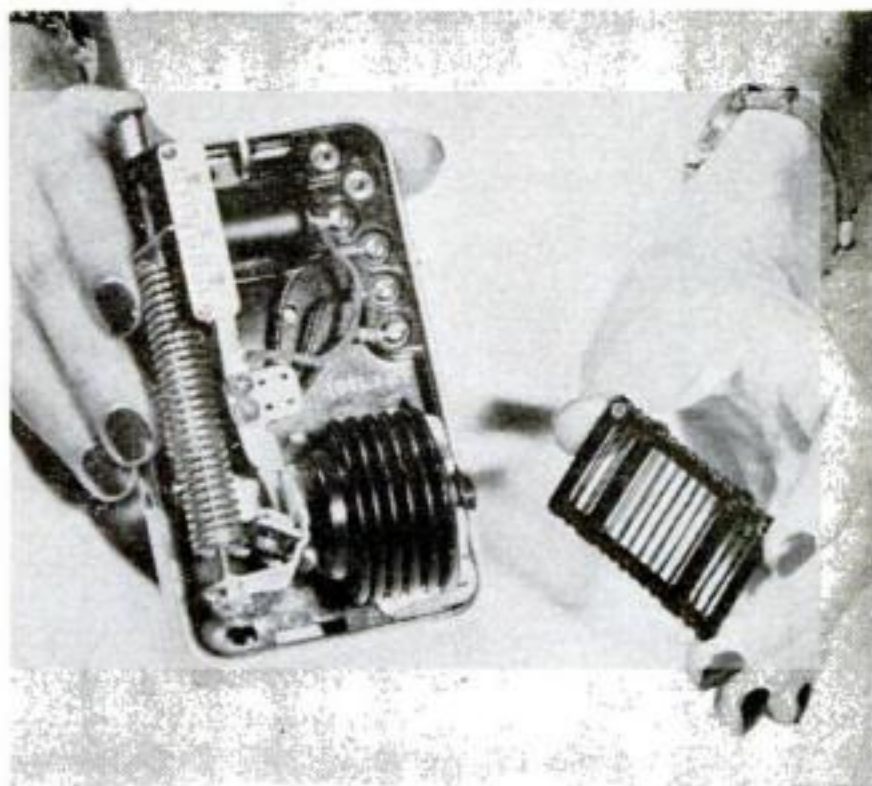
3. What happened to the mallet? If you don't have one, the side of the hammer head may be less likely to damage the chisel handle.

4. For evenness in rounding rectangular work, plane the full length into an octagon and keep cut-

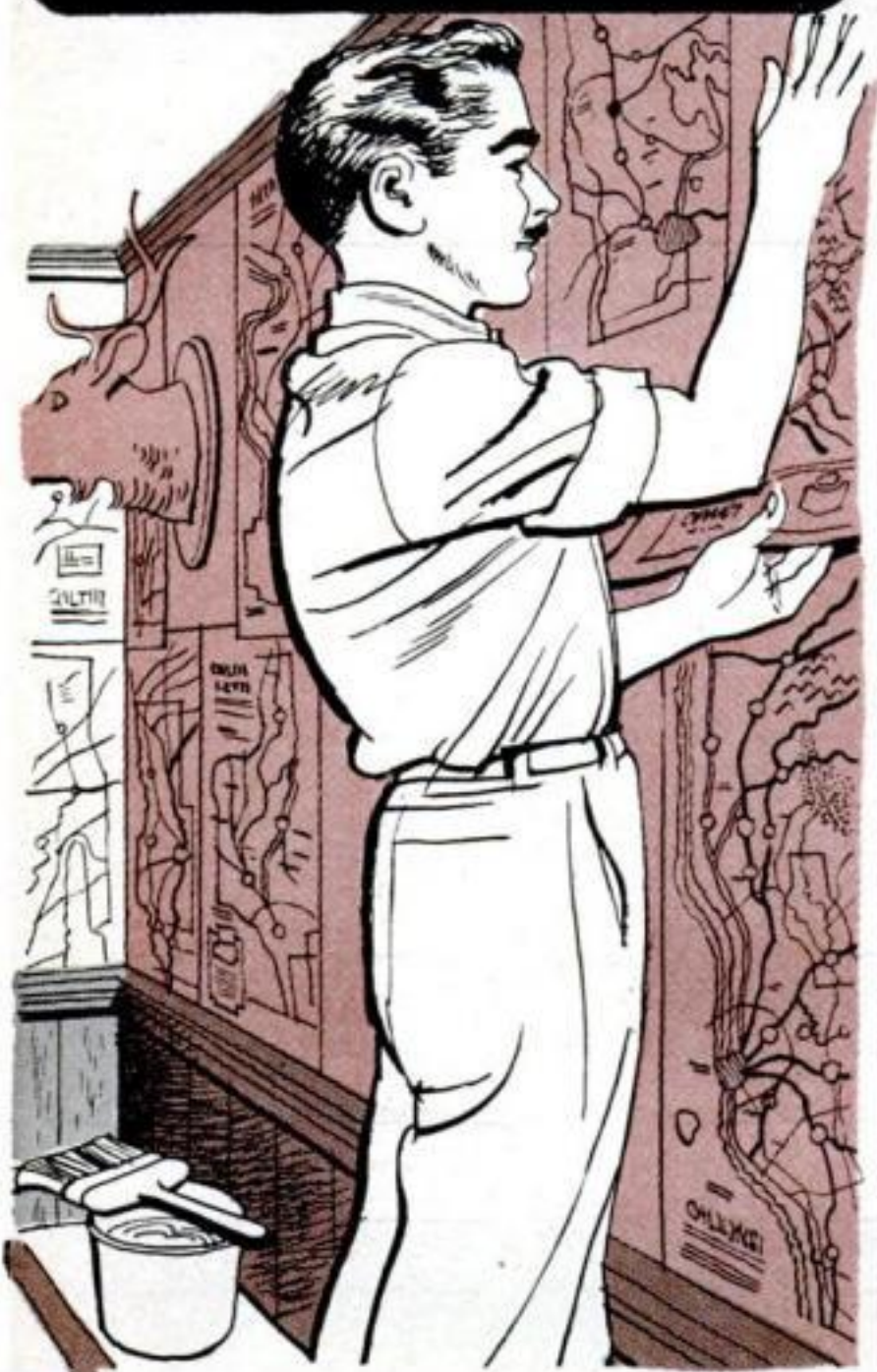
Answers

Amplifiers Make Thermostats More Sensitive

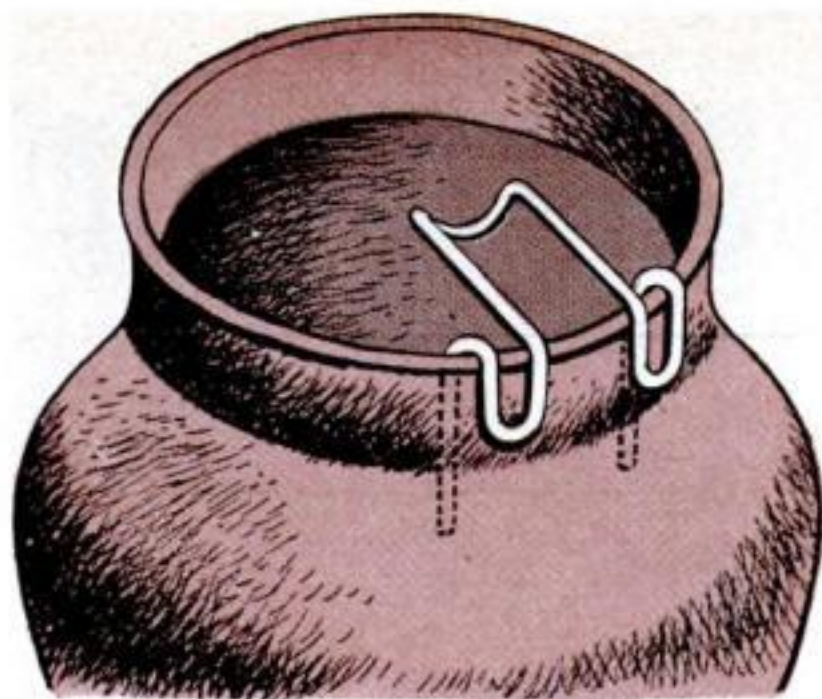
A NEW control system for air conditioners developed by Minneapolis-Honeywell Regulator Co. is said to be about 100 times as sensitive as previous controls. The tiny plastic frame at the right, wound with 51 turns of wire, replaces the larger mechanical thermostat pictured with it. Very slight temperature changes produce changes in the electrical resistance of the wire. Fed through sensitive electronic amplifiers, these changes govern the control motors which, in turn, operate the valves and dampers of the heating or air-conditioning system. Additional thermostats may be added to average the temperature of a large area or compensate for changes in outdoor weather.



Keeping the Home Shipshape



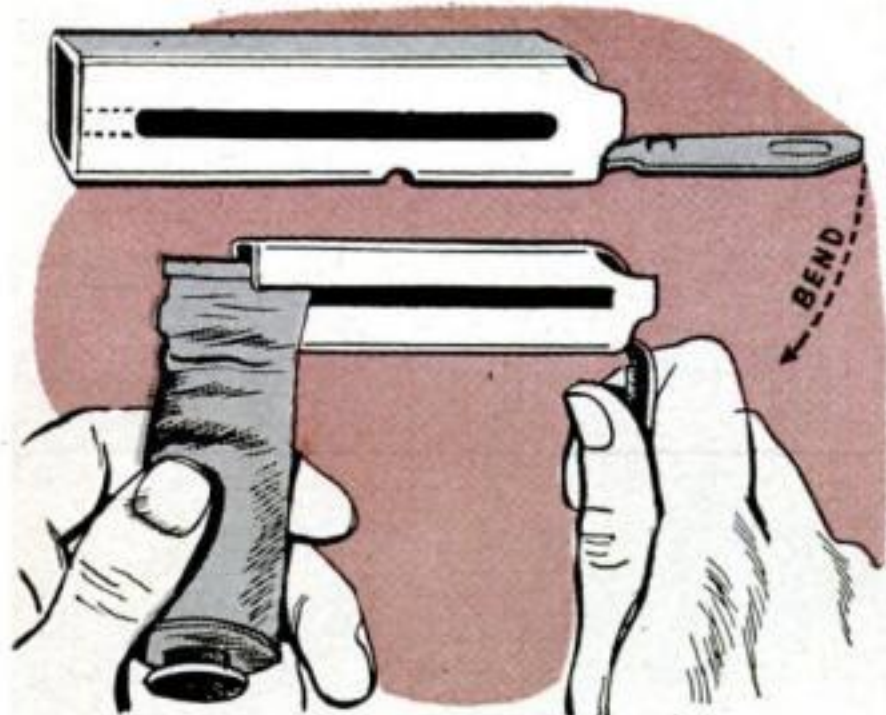
Road maps make fine, inexpensive wallpaper for a game room, attic, basement, or den. Trim the borders, apply the sheets with wallpaper paste, and coat them with clear shellac.



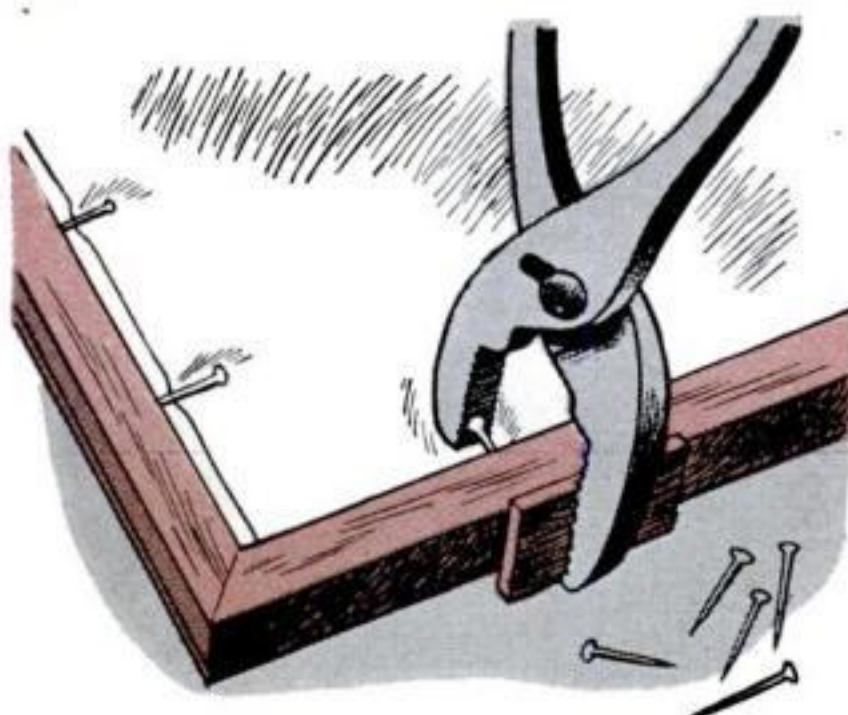
A safe ashtray for desk or shop can be made from any large-mouth jug. Bend a piece of stiff wire as shown. Then if a cigar or cigarette is neglected, it will ultimately fall inside.



Drawer pulls will serve as their own marking templates if you make two special screws. Grind the heads to points, turn them lightly into the pull, and press them into the face.



Empty magazines for injector-type razor blades help in squeezing shaving-cream tubes. Remove the clip and slip the tube in. For larger tubes, cut the slot open to the end.



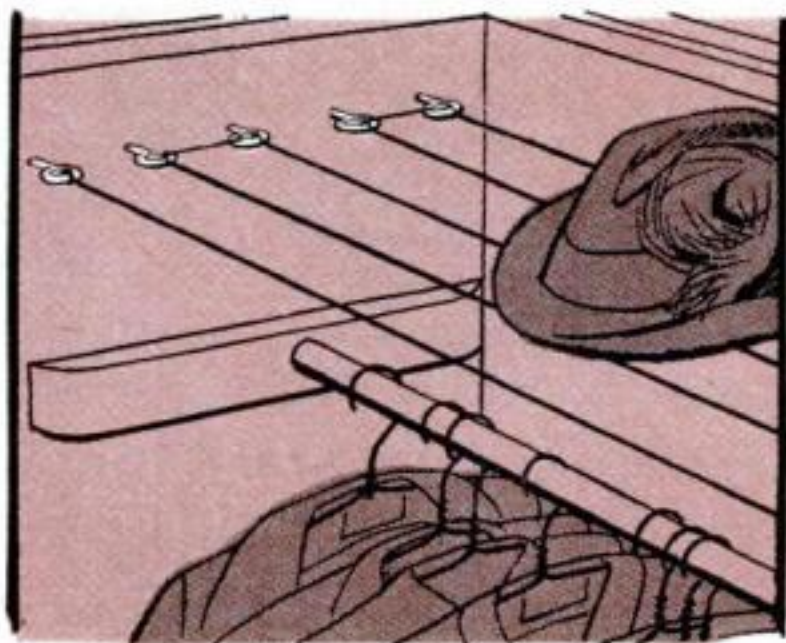
In framing pictures, a pair of slip-joint pliers is handy for driving the brads or glaziers' points that hold the picture and mat in place. Use a backing block to protect the frame.



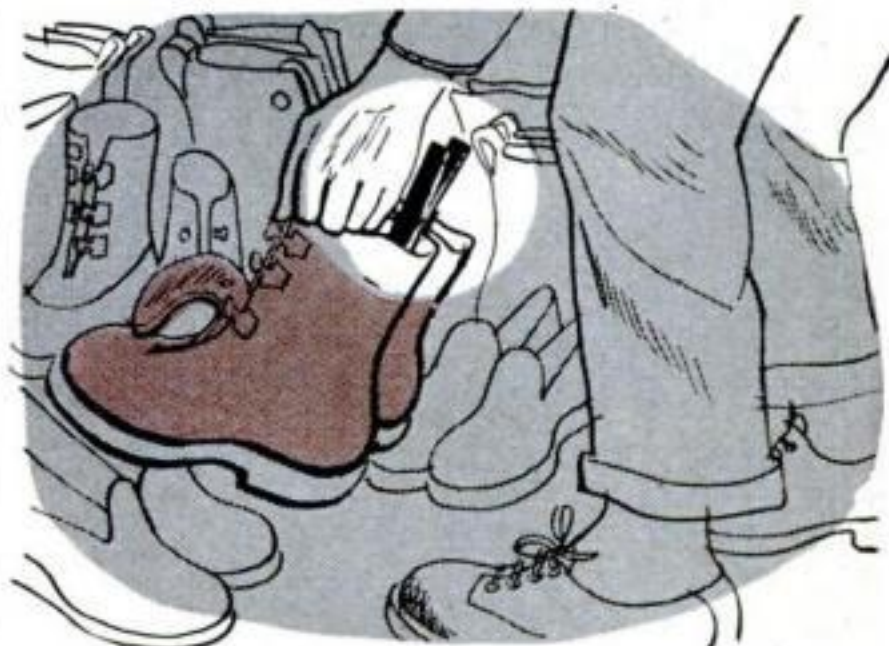
Two knife boxes purchased at the dime store will keep dressing-table supplies in order. Bolt the boxes together or screw them to a common base. Add extra partitions if needed.



To identify your preserves at a glance, add a small amount of vegetable coloring to the hot paraffin used in sealing the jars. You can also key the colors for date of canning.



An additional shelf for hats or similar light articles can be easily made by lacing four or five rows of heavy twine tightly through screw eyes set in the sides of a closet.

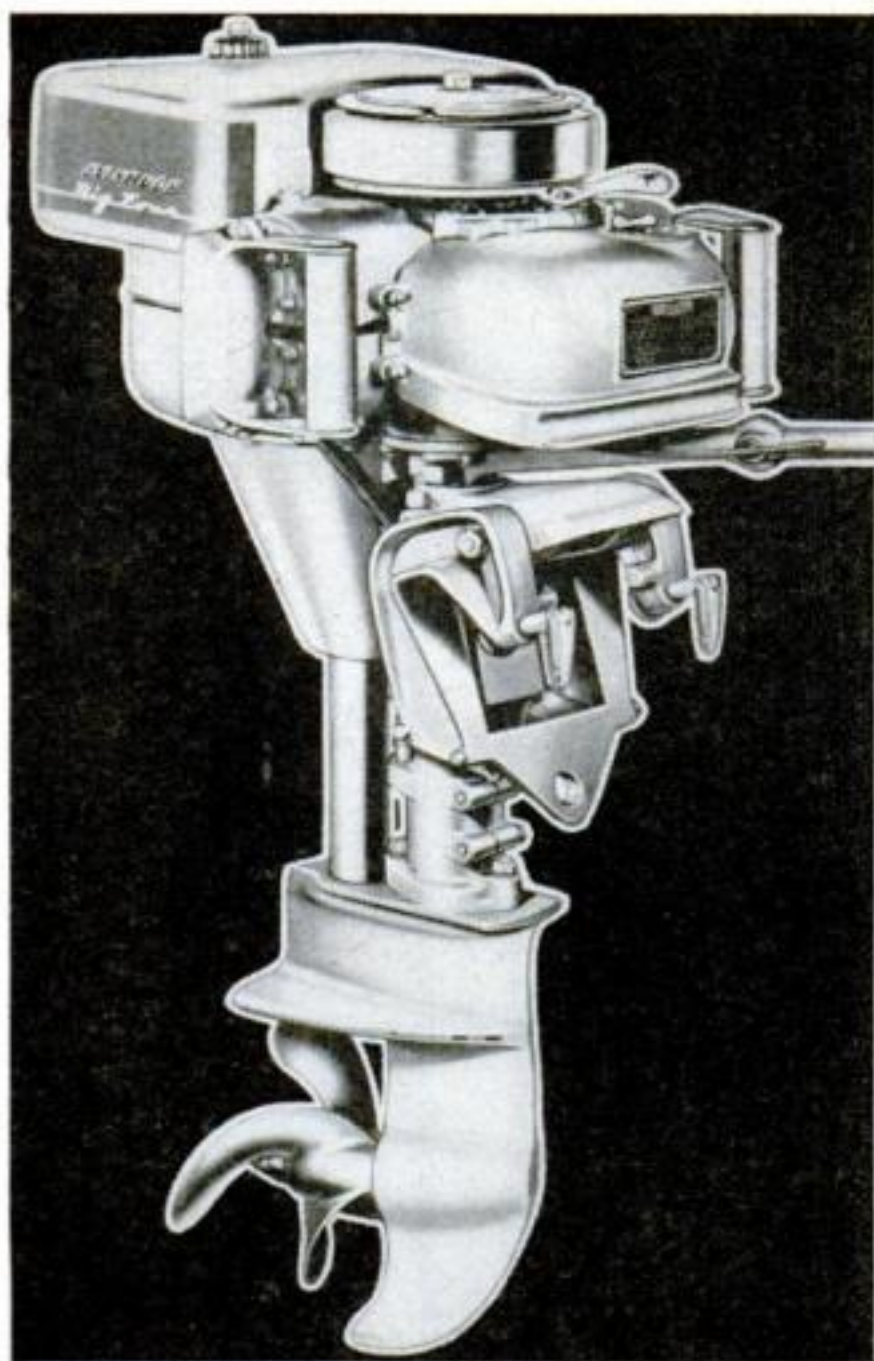


Let your child carry an initialed, spring-type clothespin to school with him. When he takes off his rubbers or galoshes, he can clip them together and locate them easily.



Appropriate tie-backs for kitchen curtains can be made from such inexpensive utensils as pan-

cake turners, spoons, or forks. Drill each handle for a screw and bend it into a flat U shape.



50-Hp. Motors Made Again

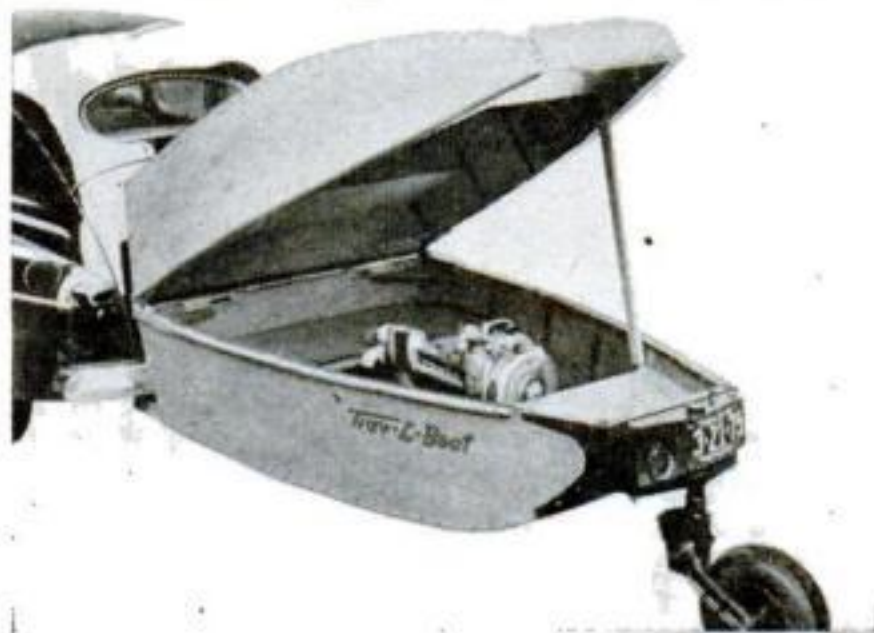
EVINRUDE Motors, Milwaukee, Wis., has resumed limited production of the Big Four[®], suspended in 1947 because of material shortages. Rated at 50 hp. at 5,000 r.p.m., the Big Four is a development of the motors used by the Army on heavy landing barges to carry combat troops and equipment across the Rhine. The motor delivers speeds up to 45 m.p.h. on large runabouts. It also is used as a heavy-duty workboat motor. Timken[®] bearings are used in the gear housing.



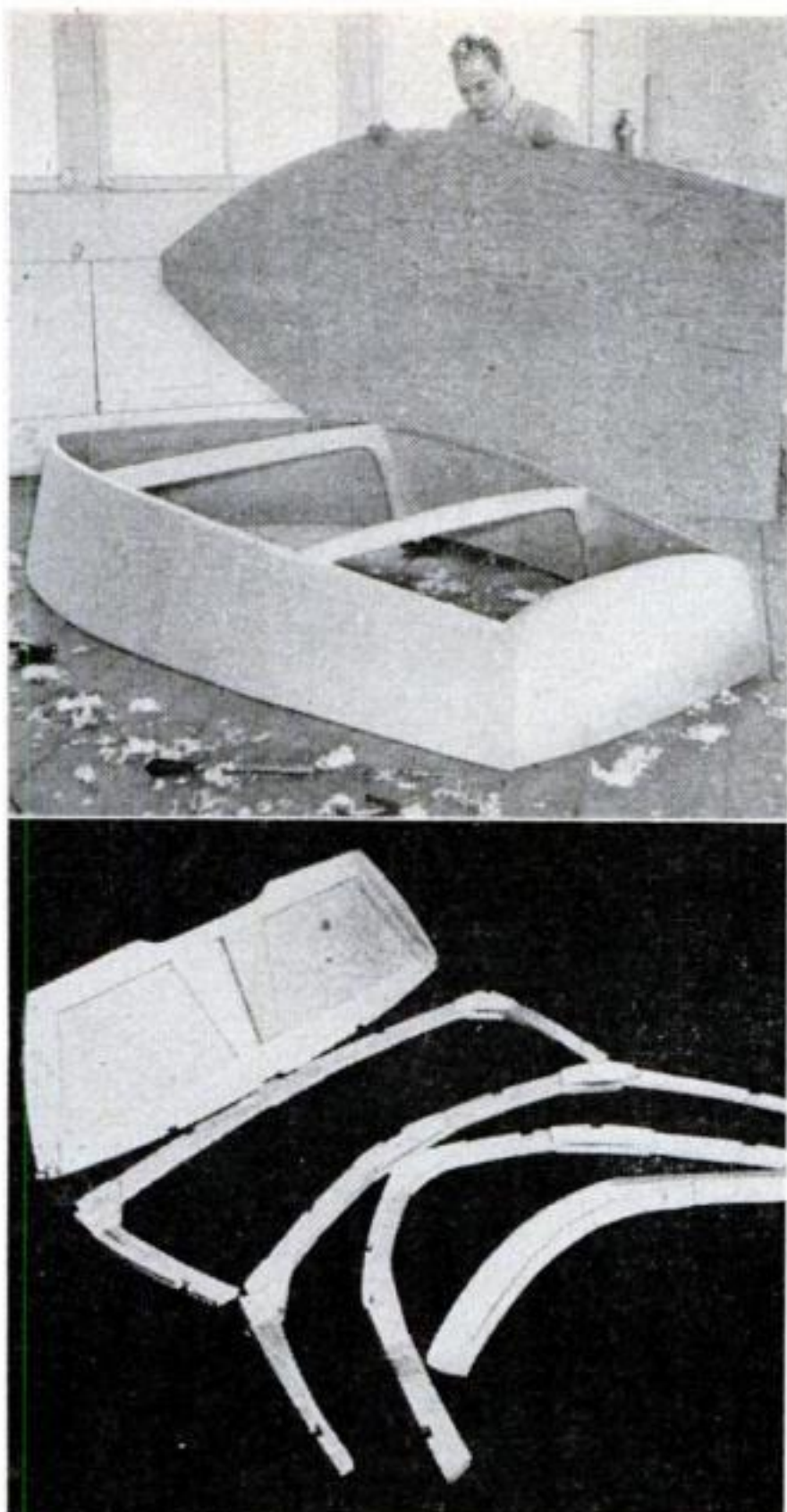
Cruiser Uses Outboard Motor

THOUGH only 15' long, this light cruiser sleeps two persons. The cabin floor board can be raised onto two runners level with the seats. This turns the cabin into a 4'10" by 6' berth. Cockpit cushions fit between seat cushions to form a mattress. Made by Orono Boat Works, Inc., Wayzata, Minn., it has a 6'4" beam and a 6" draft with motor tilted. The hull is double planked with treated canvas laid between the two skins. The boat is priced about \$1,500 complete except motor.

Trailer Splits to Form One or Two Boats



ACCORDING to the Barden and Robeson Corp., Lockport, N. Y., the builder, the Trav-L-Boat[®] can be floated as one 14' boat, separated into two 7' boats, used as a trailer, or as a 7' undercover sleeping compartment. As a boat or boats, each part may be powered by an outboard motor or oars. Used as a 14' craft, it has a 48" bottom beam and an 18" depth at center. It seats up to six persons. A 5-hp. outboard cruises it about 10 m.p.h. Built of marine plywood, it has disconnectable hinges on each gunwale that are self-locking.

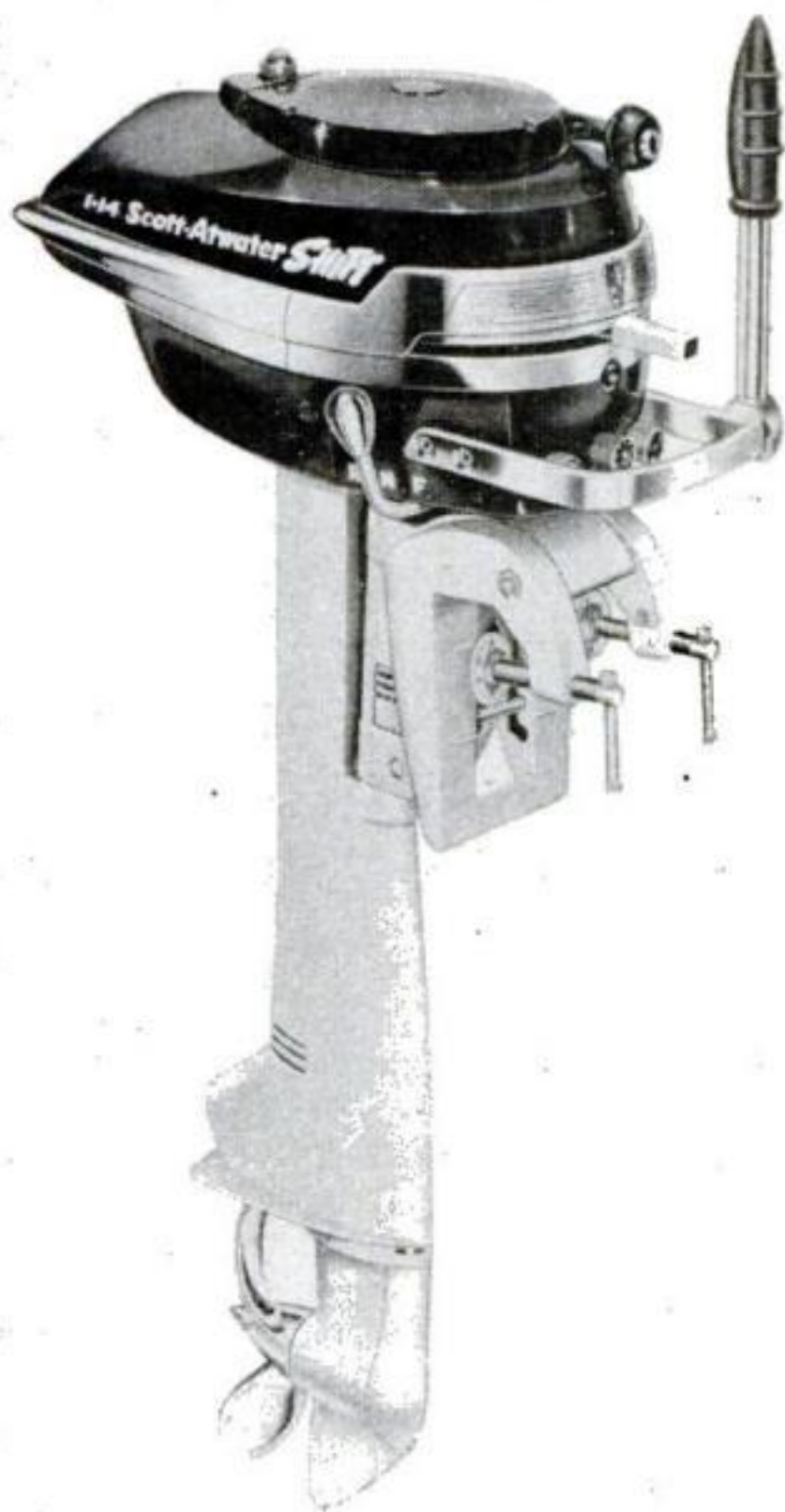


New Packaged Boats Offered

EACH of the 18 packaged boat models—from 8' to 18' long—offered by the Buffalo Marine and Sports Mart, Inc., of Buffalo, N. Y., comes complete except for paint and deck hardware. Only one model, an 8' pram, requires a building jig and that is included in the kit. The company also sells marine accessories and boat patterns.

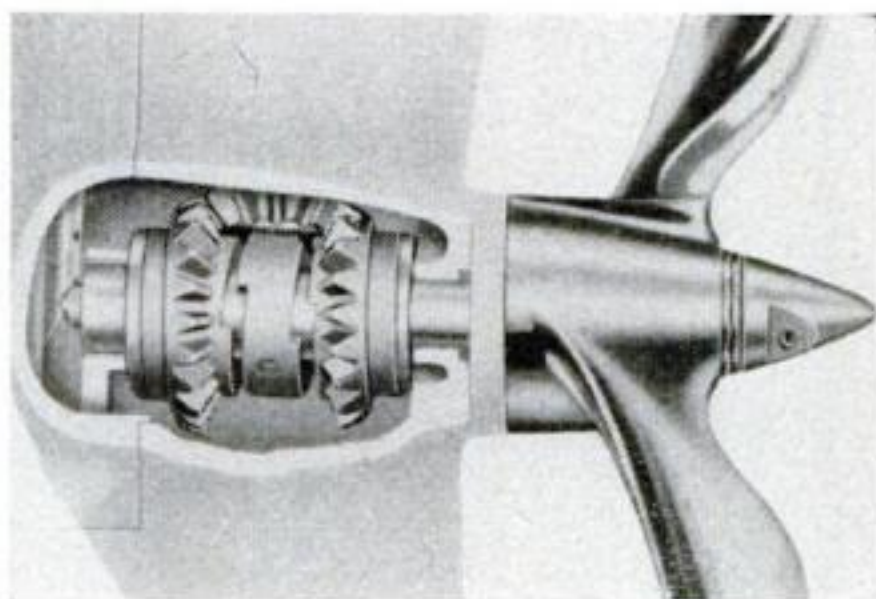
The top photo shows a one-piece plywood bottom ready to be installed. Lower photo shows another model's preassembled parts—transom, frames, and steam-bent stem with the keel attached. Completed subassemblies save about 50 percent in construction time, according to the manufacturer.

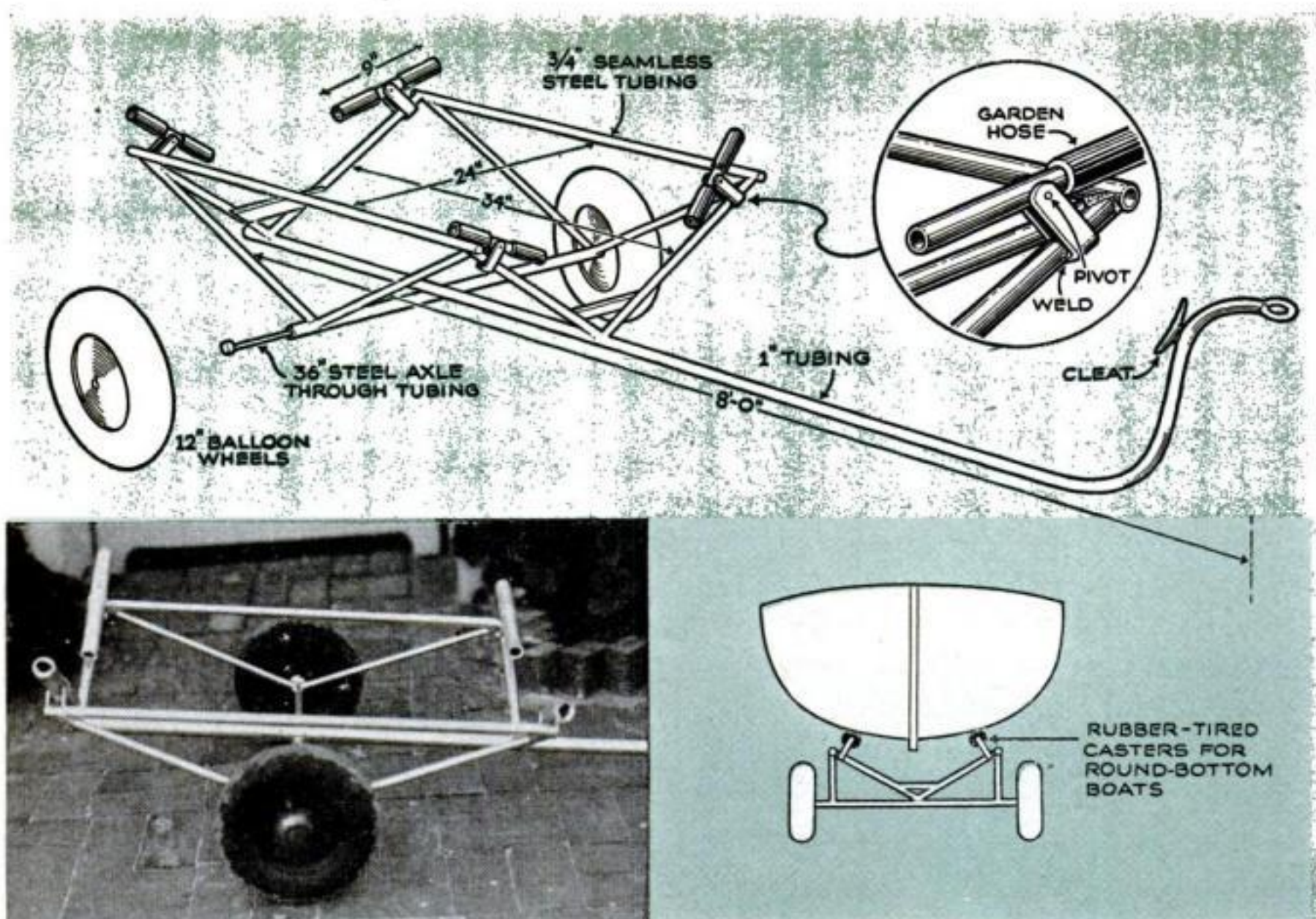
One model, a 12' skiff, for oars or outboard motor, has been designed for the completely inexperienced amateur. The transverse and longitudinal members are notched so the framework locks together, aiding assembly.



Outboard Motor Reverses

THE gear on the vertical drive shaft of the new motors built by Scott-Atwater Manufacturing Co., Minneapolis, Minn., is always engaged with both forward and reverse gears. A dog clutch on the propeller shaft is shifted to engage either one or is left in neutral. The three models with the gear shift retail at less than \$200.



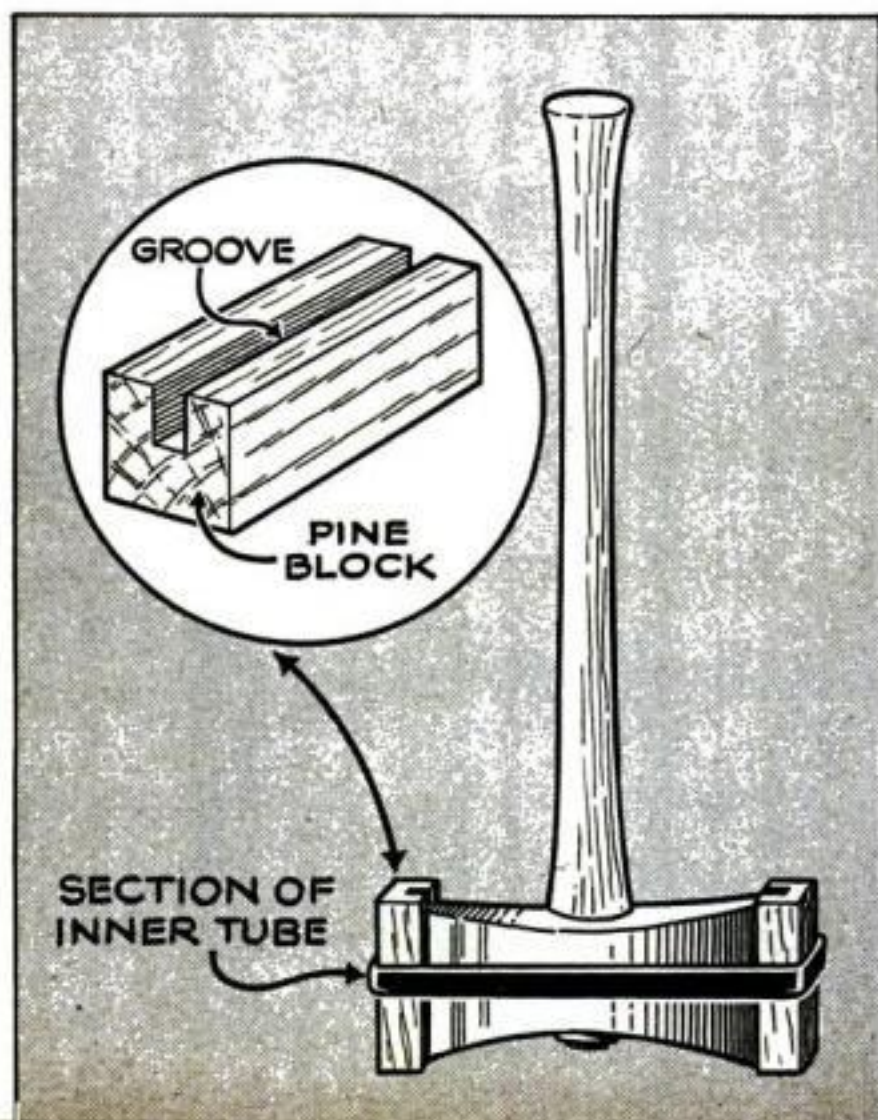


Boat Trailer Welded of Seamless Steel Tubing

DESIGNED primarily as a hand dolly for transporting a boat from cottage to beach, this lightweight trailer also can be towed with a car on short hauls over smooth pavement. It's made entirely of seamless steel tubing with welded joints.

The cradle can be built with supports for either a V-bottom or a round-bottom craft. For a V-bottom, rocker bars padded with sections of garden hose are provided. For a

round bottom, small rubber-tired casters are fitted. In either case, the supports accommodate themselves to the boat bottom. A cleat is welded to the tow bar so the painter can be secured to prevent the boat from sliding backwards when towed by a car. The steel axle passing through the tubing between the wheels should be not less than $\frac{3}{4}$ " in diameter. The tow bar is 1" and other parts $\frac{3}{4}$ " tubing.—Hi Sibley, Nuevo, Calif.

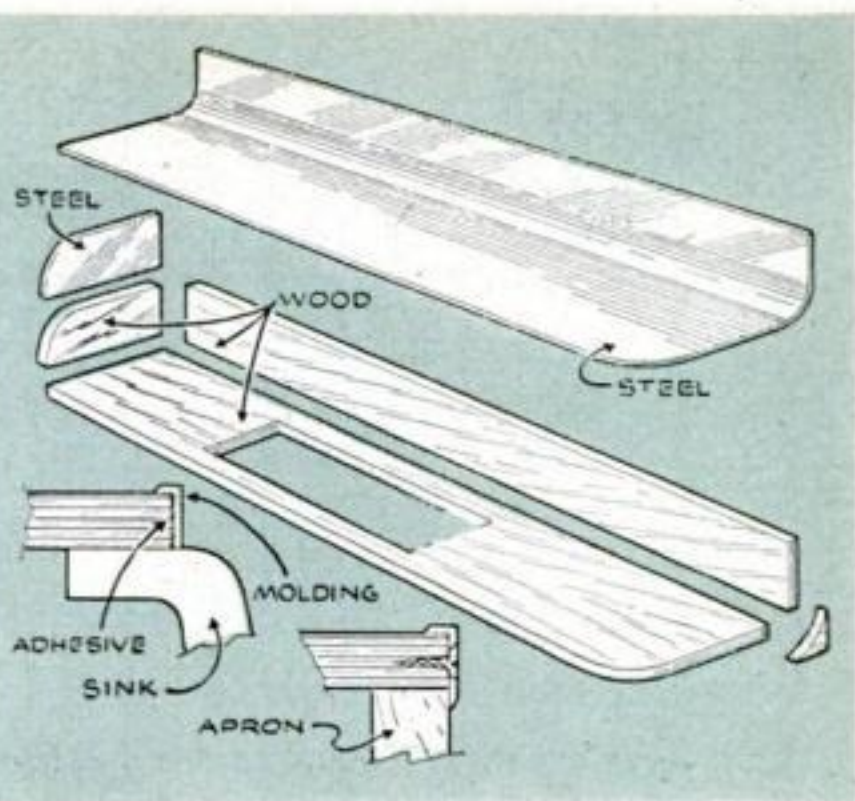


Wooden Blocks Protect Axe

Two slotted wooden blocks, as shown in the drawing at left, will protect the sharp edges of your axe bit when it is not in use. They're also a safeguard against accidents. A section of old inner tube holds the blocks together.—V. H. Lamoy, Upper Jay, N. Y.

Lag Screws Driven With Brace

I HAD to drive a number of lag screws with an open-end wrench and after a while it got to be quite a task. I switched to a brace and quickly drove the screws to within an inch, finishing up with the wrench. Of course, the proper pilot holes must be drilled first—John E. Baker, Paterson, N. J.



Stainless Steel Covers Drain

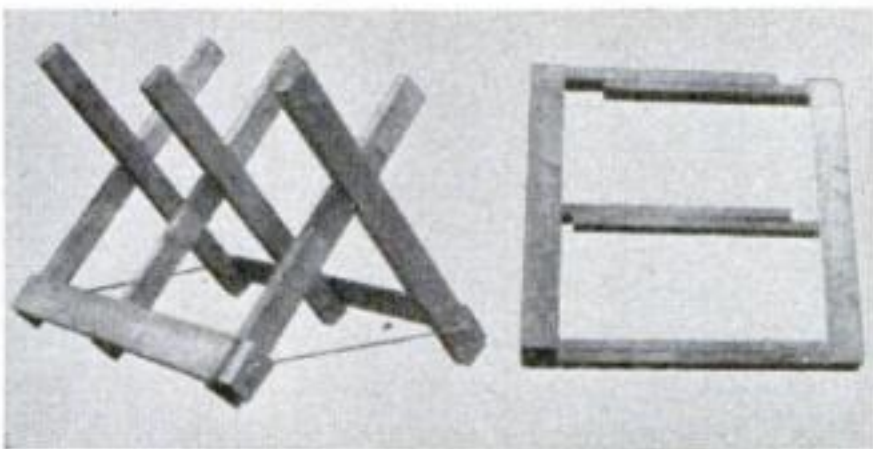
BACKED with $\frac{1}{2}$ " plywood, stainless-steel sheet offers an excellent material for covering your kitchen-sink drainboard. Buy .018" or .025" annealed sheet.

Lay out the metal oversize. Trim to size after gluing to the plywood. Pliobond® is a good adhesive for this. For a waterproof seal, also use this adhesive where the end splash board joins the other member. Use a piece of pipe as a form to bend a back curve.

To install the drainboard on an existing

cabinet, attach blocks to the underside of the plywood at intervals and tie it into the original structure. Small angle brackets with one leg shortened can be used to attach the splash board to the wall. Cut away the wall surface and set the long leg directly against a stud. Notch the upper edge of the splash board to receive the other leg. A finish edging then hides the bracket.

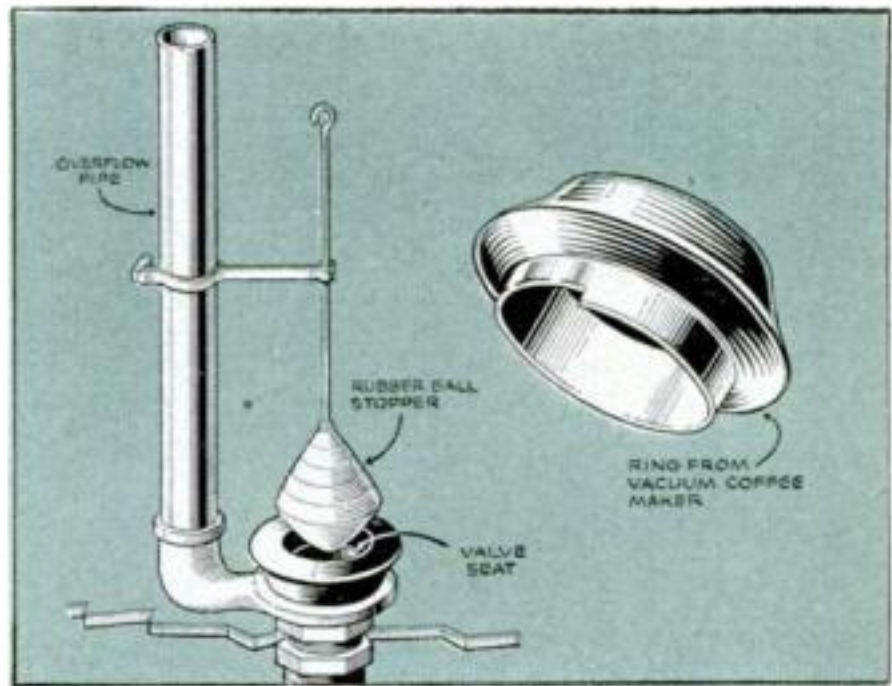
Install stainless steel or aluminum edging around the drainboard. A coating of the adhesive under the edging provides a waterproof seal.—John L. Hathaway, Los Angeles.



Sawhorse Folds for Storage

THERE'S no need to keep that old sawbuck standing permanently out in the back yard. Here's one you can fold up and store away in the woodshed, where it's protected from the weather and is no longer an eyesore.

In making it, I used two-by-fours for the crosses, pivoting them with $\frac{3}{8}$ " carriage bolts. The feet of the two-by-fours are tied together by $\frac{3}{4}$ " by 4" boards screwed in place. It's best to determine the distance between each cross by the length of the logs you're likely to cut. Two long hooks fashioned from $\frac{3}{8}$ " iron bars are placed across the ends to keep the horse rigid while in use.—Arthur R. Tanner, Cold Spring, N. Y.



Coffee-Pot Seal Repairs Valve

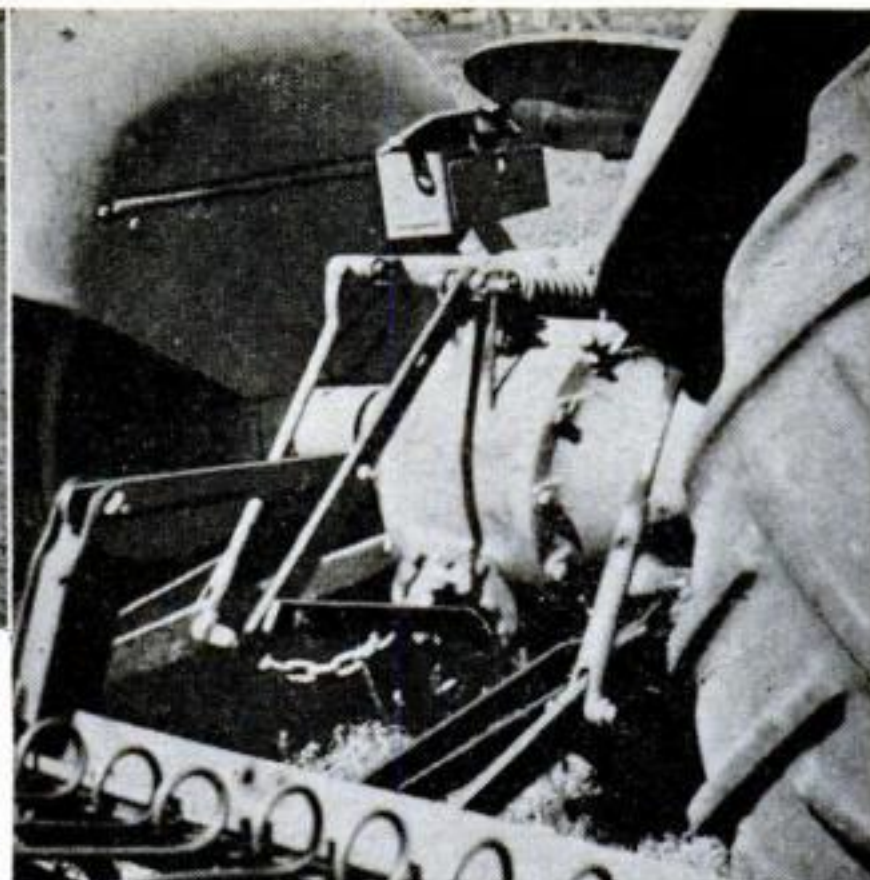
WHEN the seat of a flush-tank ball valve has become so pitted that the rubber stopper no longer makes full contact, a discarded vacuum coffee-maker sealing ring offers the means of a quick repair.

Drain the tank and dry the brass seat casting. Smear the outside of the casting with white lead or any plumber's sealing compound. Press the rubber ring in the overflow arm.—W. H. McClay, Pasadena, Calif.

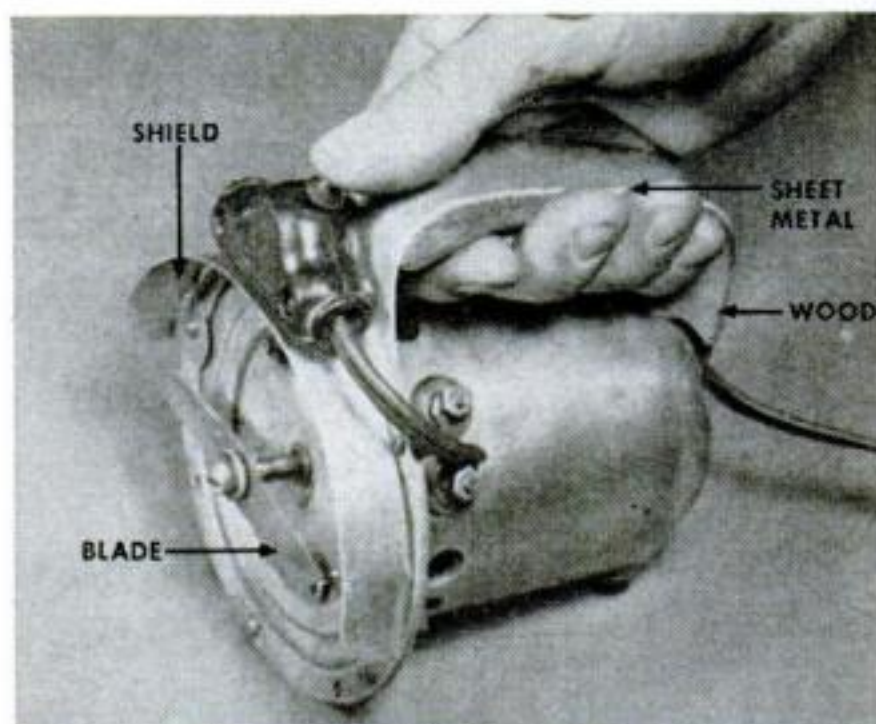


Horse Rake Used on Tractor

OLD horse rakes generally are consigned to the junk pile, but I found that a few hours' work can convert an old one to a one-man hydraulic rake for use with a tractor. Instead of buying an expensive hydraulic cylinder to operate the trip as on commercial rakes, I worked out the leverage system shown in the photo. When the hydraulic lever is pulled back on the tractor, the drawbar comes up. But at a predetermined level the bar trips the rake teeth up. By experimenting, you'll find where you want the rake to trip.



First remove all parts of the old rake except the main beam, the beam that holds the rake teeth, and the pivots. By using spacers and two bolts, you can bolt the main frame of the rake to the drawbar. To stabilize the rake, run an extra brace to a drawbar stay. In the photo at right, it can be seen running parallel to the right stay.—Howard L. Corwin, Rhame, N. D.



Old Motor Makes Trimmer

It's easy to keep shrubs in trim with this clipper made from an old vacuum-cleaner motor. The blade, sharpened on opposite sides at each end, can be an old butcher knife, a piece of hacksaw blade, or any piece of thin tempered steel. Drill a hole in its center for attaching to the motor. At left, the photos show the handle and the blade guard under the switch. Both are bent from sheet aluminum. These parts will have to be shaped and attached to suit the motor you use.—Benjamin Nielsen, Aurora, Neb.



Grass Clipper Has Long Handle

MADE by the Garden Tool Mfg. Co., Racine, Wis., this long-handled trimmer enables you to clip along sidewalks, trees, or fences without crawling on your hands and knees. Pressure on the handle operates the blades while you remain in a standing position.



3 Kinds of Camera

AS A
ROLL-FILM
CAMERA—



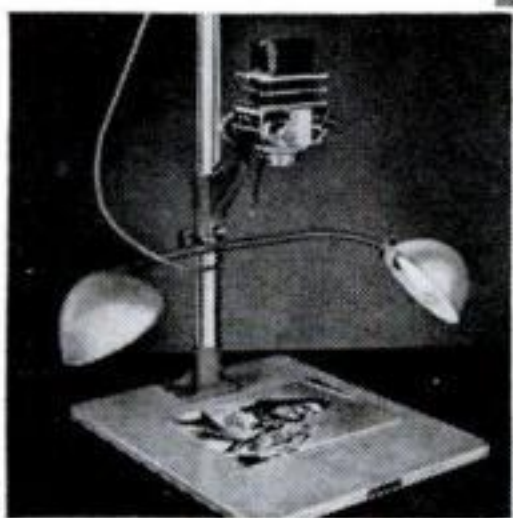
the Kodak Medalist II Camera has the accuracy and operating refinements of a precision miniature. Automatic film advance, shutter cocking, and double-exposure prevention . . . 9 speeds to 1/400.

AS A
SHEET-
FILM
CAMERA—



with the Accessory Back it quickly converts to a film-pack, sheet-film, or plate camera with ground-glass and range-finder focusing. Now you can choose from the full range of Kodak Film emulsions.

AS A
CLOSE-UP
AND
COPYING
CAMERA—



for use in combination with its accessory back and the Kodak Precision Enlarger Stand Assembly. Extension Units may be used singly or in combination for various magnifications.



Kodak Medalist II

- Take a good look at this famous Kodak camera. It's designed for a wide variety of photographic jobs. The Kodak Ektar $f/3.5$ Lumenized Lens is the finest in the $2\frac{1}{4} \times 3\frac{1}{4}$ field . . . takes superb black-and-white or full-color pictures. Flash Supermatic Shutter. Coupled range finder. Camera with field case, \$270 plus tax. Flash attachment, \$9.50 plus tax . . . At your Kodak dealer's.

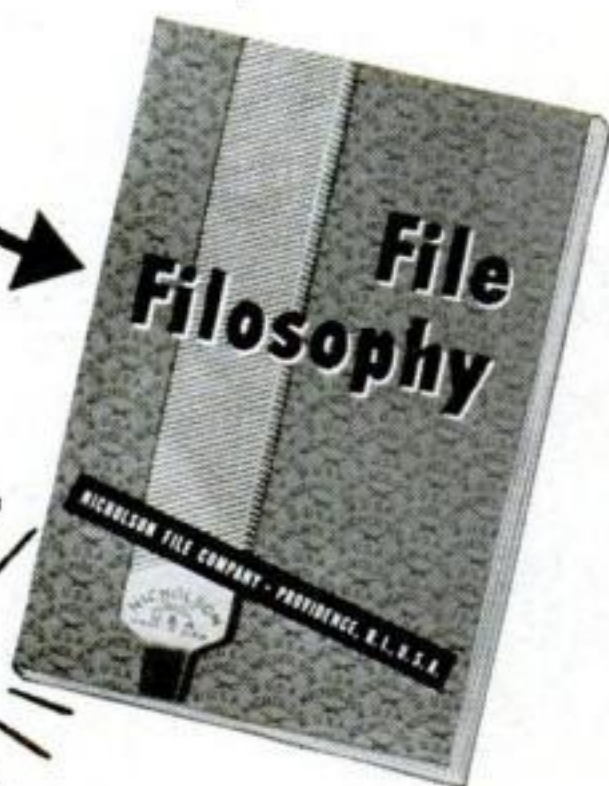
EASTMAN KODAK COMPANY
ROCHESTER 4, N. Y.

(Prices subject to change without notice)

"Kodak" is a trade-mark

Kodak

REQUIRED READING FOR HOME CRAFTSMEN



FREE!

It's yours for the asking—
a fact-packed, 48-page handbook on
the kinds, care and use of files.

Learn how to pick *The right file
for the job*; how to improve your
filing technique; how to sharpen hand-
saws, circular saws, crosscuts, tools
and implements.

Illustrations galore! Up-to-the-minute
facts about the latest developments in
files and filing techniques.

Send for your **FREE** copy of "File
Philosophy" today. Simply write to:

NICHOLSON **NICHOLSON FILE COMPANY**
19 Acorn St., Providence 1, R. I.
(In Canada, Port Hope, Ont.)



NICHOLSON
FILES FOR EVERY PURPOSE

SANDING AND GRINDING CURVES

MADE EASY

AT ONE/TENTH THE COST!

**SPRINGRITS MAKE
OBSOLETE HARD-TO-GET,
COSTLY PREFORMED ABRASIVE SLEEVES.**



Inexpensive straight strips of abra-
sive in a wide range of grits are quickly
spiral wrapped around **SPINGRIT®**
SANDING SPINDLES and securely
locked at both ends, making a fine pre-
cision tool which can be chucked into
any drill press, flexible shaft, lathe
head or electric drill.

Order today. Complete set,
1/4", 1/2", 3/4" and 1" dias., in
polished wood
case, sample
strips and in-
structions. **\$12.50**
Prepaid

FOR A LIMITED TIME
ONLY we will include 48
assorted abrasive strips (a
\$2.00 value) at no extra
charge.



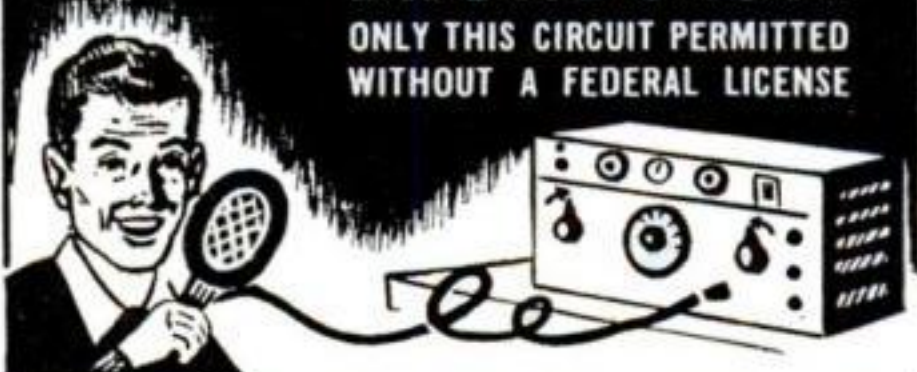
THE SPINGRIT CO.

16550 Greenfield Road, Detroit 27, Michigan

* PAT. PENDING

NOW YOU CAN BROADCAST!

**ONLY THIS CIRCUIT PERMITTED
WITHOUT A FEDERAL LICENSE**



NOW YOU CAN BROADCAST! Exercise that long inhibited desire to
get behind your own "mike" and get out on the ether! **NOW**
YOU CAN DO IT!

NO LICENSE OR TEST OF ANY KIND REQUIRED!

Use a microphone or key any place in the U.S.A. Make new friends
by radio, enjoy **REAL BROADCASTING!** **ONLY THE DOUBLE C**
CIRCUIT PERMITTED UNDER THESE CONDITIONS, a clever
method of sine modulation.

Regardless what you have read or heard to the contrary, we
**GUARANTEE THIS CIRCUIT MAY BE USED FOR AMATEUR BROAD-
CASTING WITHOUT A LICENSE, OR MONEY REFUNDED IN FULL!**
Send today for **BLUE PRINTS** and **INSTRUCTIONS** how to build
your transmitter and receiver. Full price for **BLUE PRINTS** and
INSTRUCTIONS only \$1.50 postpaid (orders East of Denver will
be air-mailed).

Complete Kit of parts for building a 25-watt transmitter, including
power supply (but not including tubes and microphone) \$29.75.
**THIS IS NOT A TOY, NOT A GADGET, NOT A PHONOGRAPH AT-
TACHMENT, NOT AN INTER-COM . . . THIS IS REAL AMATEUR**
BROADCASTING! Hurry . . . be the first in your community to be
ON THE AIR! Send \$1.50 today for your **BLUE PRINT** and
INSTRUCTIONS.

PACIFIC ELECTRONICS

P. O. BOX 212

(Dept. B)

PALO ALTO, CALIF.

DEPENDABLE

CHAMPION

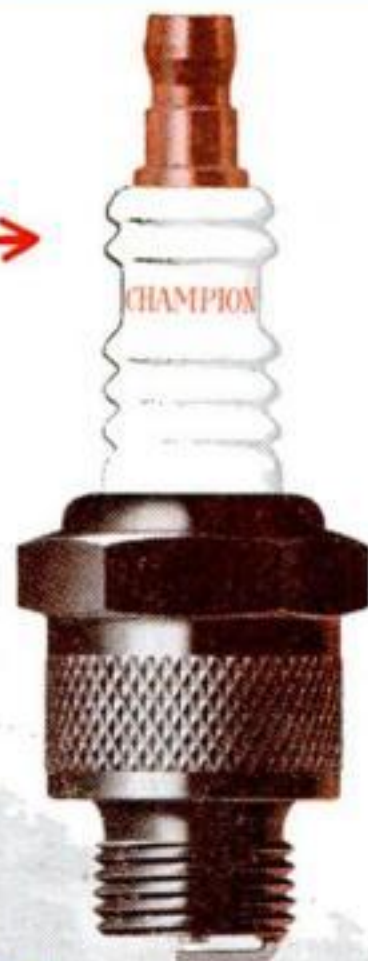
SPARK PLUGS

America's Favorite! →

Quick starting and smooth, effortless engine performance on cold mornings are, in large measure, due to dependable spark plugs. In the opinion of most engine experts and motorists in general, no spark plug is more dependable than Champion—America's Favorite—because they represent the ultimate in quality, value, performance and dependability.

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO

*FOLLOW THE EXPERTS
DEMAND NEW DEPENDABLE CHAMPIONS
FOR YOUR CAR*



Listen to the CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over the ABC network.

MARCH 1949 251

Because PYROIL gives oil the property of clinging to cylinder walls...

- it *prevents battery drain due to "dry starts".
- it *prevents scoring of cylinder walls.
- it *prevents corrosion and rust when automobile is not in use.

* it is PYROIL

Ask your gas station attendant to add PYROIL and add miles to your car.

Pyroil For Aircraft Engines

Use Aircraft Pyroil B for lubricating oil, Aircraft Pyroil A for gasoline.

GIVEN!

An attractive Pyroil metal savings bank—takes coins up to 50c pieces—is yours for the asking—sent postage paid.

Manufactured and Guaranteed by
PYROIL COMPANY,
384 Main Street,
La Crosse, Wisconsin.

Canadian Distributors:
Central Purchasing Agencies, Ltd.,
Toronto, Ontario



PYROIL COMPANY

384 Main Street, La Crosse, Wisconsin

I want my car to last and run properly. Please tell me more about Pyroil and how it can accomplish this for me.

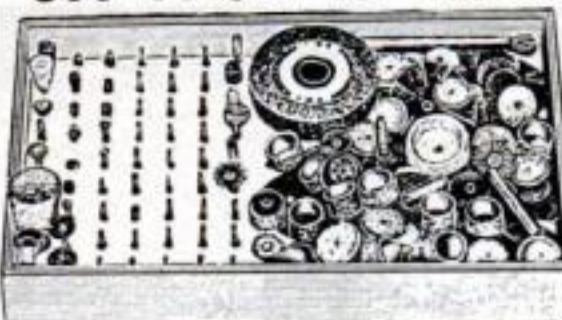
Name.....

Address.....

City or Town..... State.....



300 PIECES for ELECTRIC GRINDERS



- 3 Grinding Wheels 1 to 3" in diameter
- 12 Mounted Stones 1/8, 3/32, 1/4" Shanks
- 9 Rotary Cutters 1/8 and 3/32 Shanks
- 30 Miniature Rotary Cutters 3/32 Shank
- 10 Cut off Discs and Grinding Wheels
- 1 Drum Sander 1/8" Shank
- 15 Abrasive Bands for Drum Sander
- 15 Leather and Felt Polishing Wheels 1/2 to 1" in diameter
- 15 Felt Polishing Cylinders with Mandrel
- 25 Abrasive Sanding Discs 1 1/2 to 2" dia.
- 3 Rubber Wheels 7/8" diameter
- 2 Speed Drills 3/32 Shank
- 2 Mandrels 1/8 and 3/32" Shanks
- 3 Bristle Brushes
- 1 Rotary Wire Wheel Brush
- 1 Circular Saw on Mandrel 1/8" Shank
- 2 Rubber Cylinders with 3/32" Mandrels
- 150 other items—all new and valuable

The Master Kit fits all hand grinders for CUTTING, SHAPING, GRINDING, POLISHING Wood, Metal or Plastic

\$50 Value

Complete in Sturdy Compact Container **\$9.75** Post Paid in U.S.A.

AT NO EXTRA COST! High Speed Steel Rotary File (list \$2.55) included if you order now.

NOTE: This Master Kit is brand new. Get yours now while the getting's good! Rush check or M.O.



18 ROTARY CUTTERS

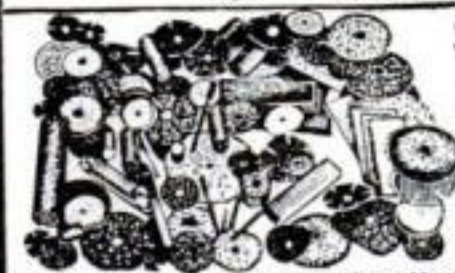
\$13.50 Value **\$5.85** Post Paid in U.S.A.

Assorted sizes cutter on 1/8" or 3/32" shank. Will fit all hand grinders. Ideal for cutting wood, metal, or plastic. Brand new.



2 CIRCULAR SAWS

AT A RECORD BREAKING PRICE—BOTH AT ONLY... **\$1.50** Post Paid in U.S.A.



SURPRISE VALUE

100 Pieces **\$1.00** Post Paid in U.S.A.

A Bagful of Bargains at Grinding Wheels, Cut-off Wheels, Sanding Discs, Mounted Stones, Sharpening and Honing Stones, Rotary Cutting Burs, Abrasive Cartridges, and many other items. Rush check or Money Order.

SCHUPACK SUPPLY CO., 7331 Cottage Grove, Dept. 53, Chicago 19, Ill.



BUILD YOUR OWN ENLARGER

Enjoy Photography's most fascinating hobby at a fraction of usual cost. With simple step-by-step instructions and diagrams plus a screwdriver and pliers you assemble your own Enlarger and Save! Get all features of more expensive Enlargers: precision machined aluminum alloy castings, 90° tilt for wall projection of prints, spherical aluminum lamp-house, helical rack and pinion focusing with extra large knobs, unconditional guarantee. For 35mm to 2 1/4 x 3 1/4 negatives. Time payment plan.

Write Today for Free Illustrated Folder

CALIFORNIA TECHNICAL PRODUCTS CO.
448 So. Hill, Dept. K-2, Los Angeles 13, Calif.

NEW 1949 CATALOG

48 PAGES OF REAL VALUES

for the home workshop—hobbyists—woodworking equipment—sprayers—welding outfits—tools—motors—hundreds of other items.

Make this interesting catalogue your shopping guide. Send 10c to cover handling and mailing—TODAY.

MIDWEST SALES CO. 2533 D INDIANA KANSAS CITY, MO.

DUAL CROSS and ROTARY FEED

PALMGREN TABLE ROTARY, INDEX, MILLING

Has 8" table, 360° movement and 4" cross feed travel. Adjusting wheels and dials graduated in degrees and thousands. Slotted for bolting to table. No. 83 Priced \$49.50. No. 82 without rotary feed \$39.75.

Write for Circular No. 10
CHICAGO TOOL and ENGINEERING CO.
8396 South Chicago Ave., Chicago 17, Ill.



Replace with a
DELCO BATTERY
for GOOD SERVICE
for a LONG TIME



DELCO BATTERIES FOR PASSENGER CARS, TRUCKS, BUSES AND
TRACTORS ARE SOLD BY DELCO BATTERY DEALERS EVERYWHERE

DELCO-REMY *WHEREVER WHEELS TURN OR PROPELLERS SPIN*



HERE IS YOUR JOB in AVIATION

We have hundreds of urgent requests for Embry-Riddle ground and flight graduates -- many times the graduates we had available could have been placed in the last 3 months. Never has there been such opportunity for you in aviation. Begin your career now. A few short months at Embry-Riddle and you're ready for a good job with best pay.

EMBRY-RIDDLE OFFERS

Complete training in minimum time for A&E Mechanics and all fundamental flight, specialist and technical positions • Modern airline-size hangars, classrooms, shops and airplanes • Experience gained over a quarter-century of aviation training • Living facilities on the airport.

INDUSTRY NEEDS

Mechanics, technicians, specialists, engineers, pilots -- many, many more men than all aviation schools together can supply. The shortage of trained personnel is becoming more acute. Get in on the ground floor... Embry-Riddle students are spoken for well ahead of graduation. Don't delay. Write for proof of job opportunities TODAY. Begin your aviation career at Embry-Riddle NOW.

**AUTHORIZED
G. I.
TRAINING**



Dean of Enrollments - Dept. 91
Embry-Riddle School of Aviation
Miami 30, Florida

Please Print

NAME _____

ADDRESS _____

City _____

State _____

Age _____

I am interested in...

- ☐ A.&E. Mechanic
- ☐ Commercial Pilot
- ☐ Engineering
- ☐ A.&E. Combined with Commercial Pilot
- ☐ Flying Mechanic
- ☐ Drafting & Design

Check One ☐ Veteran ☐ Non-Veteran

TRAIN IN MIAMI--AIR CAPITAL OF THE WORLD

A NEW KIND OF MOTORCYCLING
WITH



SAFE-COMFORTABLE-POWERFUL

Automatic Clutch. Telefloat Spring Suspension.
Foot Gear Shift. 95 miles per gallon. 70 Miles per hour.
See and drive it at your nearest JAWA DEALER or
write for free folder.

DEALER INQUIRIES INVITED

JAWA MOTORCYCLE CO.

2432 Grand Concourse Dept. 5
Bronx 57, New York

Build Four Radios with Easy-to-Follow Blueprints

• Build a Screen Grid Receiver, All-Electric Headphone Receiver, Short-Wave Receiver & Flyweight Portable. Only \$1.40 for all four blueprints! Address Popular Science, Dept. 39, 353 4th Avenue, New York 10, N. Y.



LAWN ORNAMENT-NOVELTY PATTERNS

28 Lawn Ornament Patterns, 25c. Other patterns: 15-20" high; Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 10c each. 25 Novelty Patterns, 30c. All 62 Full Size Patterns, \$1.00 Postpaid.

FLYING DUCK

Wind revolves wings. Realistic appearance. Pattern, Instructions and wing Pinion Kit; brass bearing, steel shaft, wing lugs, bolts, nuts and washers, 50c. Pattern and Instructions without kit, 25c. Postpaid.



Dept. 7-AR

STROTHER PATTERN SERVICE
Box 128

Belington, W. Va.

DOUBLE ACTION *Micro Actuated Switch*

Double pole,--either normally open or normally closed, or both circuits at one time. Rated at 10 amp. load on house current.....3 for \$1.00 postpaid

Send today for free catalog of Electrical & Mechanical devices for Experimenters, Craftsmen, Model Builders, Research Engineers.

SURPLUS AT BARGAIN PRICES

F. J. SIEFKE & CO. 921 Delavan Ave. Buffalo 15, N. Y.

CIGARETTES

ALL POPULAR BRANDS
Per Carton Postpaid

\$1.57

Minimum order 5 cartons--quantity discounts.

MIDWEST SALES CO.

2533 H Indiana
Kansas City, Mo.

No. 85
Utility Boat, \$1.00



No. 113
Garage & Tool House,
\$1.00



No. 75
Terrace Table,
\$0.35



No. 80
Service Counter, \$0.60



MAKE YOUR OWN *and* SAVE WITH AN *Atlas* TILT/ARBOR SAW

No. 78
Garden Chaise, \$0.35



\$89.75
F.O.B.
Kalamazoo
less motor,
and
extensions.

Thousands of American men are using their shops to save hundreds of dollars a year . . . building shelves, cupboards, cabinets, garages, furniture remodeling . . . beating high prices with their own skill and the new Atlas big-capacity quality tools. So can you. The 97 Easi-Bild patterns will help you get started. An Atlas 8" Tilt/Arbor saw should be your first shop power tool.

The Atlas 8" gives you so much more saw for your money it's hard to make comparisons. It has a tilting arbor — *table is always flat*. Cuts 2 $\frac{3}{8}$ " deep. The table is *grey-iron — precision-ground*. It is 22" x 18" (22" x 35 $\frac{1}{2}$ " with two extensions) and has 10 $\frac{5}{8}$ " working surface ahead of blade — the capacity you'll want for big boards and panels. The new-type rip fence locks at *both* ends — releases instantly for easy positioning. Vernier control for fine adjustment. Blade height and angle controls work smoothly. Dust-sealed *ball bearings* assure long, smooth, accurate service.

See the saws at your Atlas dealers. Start saving money with your shop this month! Send the coupon today for full details about the tools you want.

Atlas TOOLS FOR YOUR SHOP



24" Jig Saw



Spindle Shaper



6"-10" Lathes



Drill Presses



Belt, Disc Sander



12" Wood Lathe

**SEND
THIS
COUPON**

ATLAS PRESS CO., 355 N. PITCHER ST., KALAMAZOO, MICH.

Send details on these Atlas Tools:

☐ 8" Saws ☐ Spindle Shaper
☐ 24" Jig Saw ☐ 10" Metal Lathe

☐ Drill Press
☐ Belt & Disc Sander
☐ 12" Wood Lathe

Cash Included for These Patterns

☐ No. 78 ☐ No. 113 ☐ No. 75 ☐ No. 80 ☐ No. 85

Send Complete Pattern Catalog

Name _____

Address _____

City, State _____

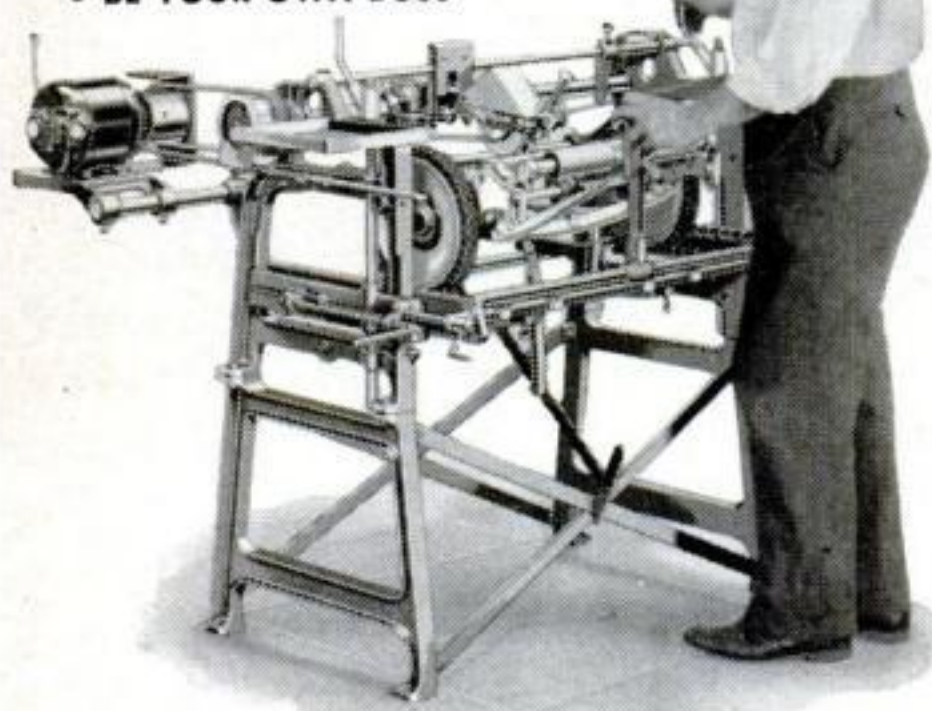


**MATCHED PRECISION TOOLS FOR
WOODWORKING AND METALWORKING**

YOU'RE NEVER OUT OF WORK

when you have a
sideline business
to fall back on

- STEADY, PROFITABLE INCOME
- NO EXPERIENCE REQUIRED
- BE YOUR OWN BOSS



IN SPARE TIME OR FULL TIME SHARPEN LAWNMOWERS ON THE IDEAL SHARPENER

YOU can put one of our IDEAL Lawnmower Sharpeners in your garage or basement and start a good paying business of your own—on the side—or full time—sharpening lawnmowers. In a short time your earnings will pay for the machine. From then on, everything you take in is "gravy."

Get started now! Early this spring and all summer, people in your neighborhood will keep bringing you mowers to sharpen. Just place the lawnmower in the IDEAL, make a few simple adjustments! The IDEAL does the rest. You collect the cash! Get the facts! Be first in your neighborhood!



Send for
this **FREE**
booklet today!

THE FATE-ROOT-HEATH CO.
DEPT. D-4, PLYMOUTH, OHIO

BUILD YOUR OWN TILTING ARBOR SAW!

SAVE
\$50
OR MORE

Exclusive GIL-BILT Build-It-Yourself Features

- No machining—build easily with hand tools only
- No blueprint reading—step-by-step pictorial plans, full scale patterns, actual photographs
- Sturdy wood, aluminum, and steel construction
- Capacity and performance of commercial saws selling for \$60 and up

GIL-BILT 10-INCH TILTING ARBOR SAW



- 27x28 in. table, 13 1/2 in. capacity in front of blade
- 10 in. blade cuts 3 1/4 in. deep, tilts full 45 degrees
- Floor model 34" high table always stays level

- New Departure ball bearing arbor, 3/4" precision shaft turned down for 5/8" bore blades, alum. housing, shipped ready to run
- Jackscrew and 4 1/2 in. dia. handwheel lowers and raises blade
- Cast aluminum miter gauge and self-aligning rip fence guide

Gil-Bilt Metal Parts Kit includes Plans, Ball Bearing Arbor, Miter Gauge and Bar, Rip Fence Guide, Machined Lock Knobs, Jackscrew Mechanism and Handwheel, and All Other Metal Parts (less blade).....**\$20.95**
Same Kit with 10" comb. blade.....**25.90**
Same Kit with 8" comb. blade.....**24.90**

GIL-BILT 8-INCH TILTING TABLE SAW

- 21x27 in. table tilts full 45 degrees, 13 in. capacity in front of blade
- 8 in. blade cuts from 0 to 2 1/2 in.
- New Departure ball bearing arbor, 5/8" precision shaft turned down for 1/2" bore blades, alum. housing, ready to run
- Cast aluminum miter gauge and self-align. rip fence guide (same as above)



Gil-Bilt Metal Parts Kit includes Plans, Ball Bearing Arbor, Miter Gauge and Bar, Rip Fence Guide, Machined Lock Knobs, Tilt Support Segments, and All Other Metal Parts (less blade).....**\$15.95**
Same Kit with 8" Combination Blade.....**19.90**

GIL-BILT 12-INCH BAND SAW



- Cuts to center of 24 in. circle
- Handles stock up to 6 in. thick
- Fully enclosed mechanism for utmost safety
- Wheels turn on heavy 5/8 in. shafts, four Oilite bronze bearings
- 18x18 in. table tilts 45 degrees

- Upper wheel tension and tilt mechanism of cast aluminum; completely assembled
- Two blade guides, each has ball thrust bearing, self-lub bronze jaws
- Rubber tired wheels. Choice of cast alum. or make-your-own wood wheels on metal hubs

Uses standard 78 in. blades up to 3/8 in. wide
GIL-BILT Metal Parts Kit includes Plans, rubber tires, 3/16" blade, hubs for wood wheels, bearings, shafts, tilt mechanism, guides, tilt support segments, and all other metal parts.....**\$16.95**

Same kit with two ready-to-install 12" cast aluminum wheels **\$20.95**

NO DEALERS—ONE LOW PRICE! Prices include postage up to 600 miles. Send cash, check or money order for complete kit, or send \$1.00 for Step-by-Step Plans and Order kit later less cost of Plans. Plans sent postpaid anywhere in the world.

GILLIOM POWER TOOLS

P. O. Box 1-VC, Lambert Field, St. Louis 21, Missouri

COMPLETE
PLANS
only
\$1.00
EACH

STOP

CHANGING MOTOR OIL--
KEEP IT CLEAN INSTEAD!



End this needless
waste and expense forever with
RECLAIMO Today's Most Advanced
Oil RE-REFINING Filter

Continuously cleans and RE-REFINES motor oil as you drive (by utilizing motor heat)—keeps oil in high grade lubricating quality at all times—reduces motor wear to a minimum! Proves conclusively that "Oil Does Not Wear Out Mechanically" as stated by U. S. Bureau of Standards, (Bulletin 86).

"RECLAIMO"

- REMOVES SOLIDS (by filtration)
- REMOVES WATER (by distillation)
- PREVENTS Excess Fuel Dilution
- PREVENTS Acid and Sludge Formation
- MAINTAINS Stable Viscosity
- ELIMINATES All Oil Changes

CAR • TRUCK • TRACTOR OWNERS!

You'll want to know more about Reclamo's Oil, Motor and Money-Saving Features. **FREE 40-PAGE BOOK "OIL FACTS"** gives you the complete "Reclamo" story plus details about our New 90-Day No Risk-No Cost TRIAL OFFER! WRITE for YOUR COPY TODAY!

NEW ADDED FEATURE!
Gas - Moisture
Vapor Injector
Increases Mileage
with Smoother
Performance



RECLAIMO MFG. CO.

5083 ELSTON AVE., Dept. 91, CHICAGO 30, ILL.

REPUTABLE DEALERS WANTED



Presenting

**THE NEW *LUFKIN* "CHROME CLAD"
MICROMETER—with Non-Glare Satin Finish**

7 SUPERIOR FEATURES

*"Chrome Clad", Non-Glare Satin Finish, Easy to Read, Rust and Wear Resistant • Hardened Ground Thread • Easy Adjustment • One Piece Spindle • Cutaway Frame • "Rapid Reading", (Each Thousandth Numbered) • Micro-Lapped Mirror-Like Finish on Anvil and Spindle Ends.

*Before releasing Lufkin Chrome Clad Micrometers to the public they were used for several years in our own plant on various types of rough and finished metal working production. All micrometers tested have retained their non-glare satin finish to our complete satisfaction.

Lufkin adds another important feature to the many which now distinguish its famous Micrometers,— "Chrome Clad", Non-Glare Satin Finish. Utilizing recent pacesetting developments in metal finishing, Lufkin now applies a heavy chrome plating to its micrometers. This finish *possesses a non-glare quality*

which makes reading easier than ever before. You get your reading at a glance in bright or poor light. Markings stand out sharp and bold against the satin finish. It is rust and wear resistant. Here's a real ally for the precision worker to whom accuracy is a "must". Ask your dealer to show you this improved precision tool.

PRECISION TOOLS ***LUFKIN*** TAPES • RULES

Accuracy of Measurement is the Key to Precision

THE LUFKIN RULE COMPANY • SAGINAW, MICHIGAN

MARCH 1949 257



5 Kinds of Work
with 1 Tool

1. Handgrinding
2. Bench-grinding
3. Lathe-grinding
4. Flexible-shaft
5. Sanding-Polishing

DUMORE Duplex Handgrinder

**A versatile tool with plenty of power
—to do your work faster and easier**

You can see by these pictures why home-workshop fans say, "The Dumore Duplex is the handgrinder to buy!" *It's a real tool* — rugged and powerful. And it's built to do everything from delicate carving in plastic and wood to tough clean-up jobs on hard weld-metal!

Just think of the advantages of these features:

1. A full $\frac{1}{4}$ hp Dumore motor for no-stall power.
2. An extra-capacity chuck for $\frac{1}{4}$ ", $\frac{1}{8}$ " and $\frac{3}{32}$ " tools.
3. Attachments that convert it instantly to Flexible Shaft Tool, Bench Grinder, Toolpost Grinder, Sander-Polisher.

It is almost impossible to list all of the hundreds of jobs you can do with this fine Dumore tool in any workshop. We hear of new ones every day from enthusiastic, satisfied users. And every job is done faster, easier, and *better* — thanks to the Duplex. Enjoy working with a tool that adds so much more fun to your hobby. Get a Duplex today.

**Tear out
this coupon
and mail
today**

— for complete information on the Dumore Duplex Grinder, Flexible-shaft attachment, Handy-Sandy, Bench Stand, and Toolpost Bracket.

The Dumore Company, Dept. C-52, Racine, Wisconsin

Please send me the items checked:

- ☐ Duplex Deluxe Kit with 27 accessories. \$27.50 enclosed
- ☐ Duplex Standard Kit with 9 accessories. \$19.75 enclosed
- Shipping Charges C.O.D. on all items
- ☐ Complete information on the Duplex Grinder and all accessories.

Name.....

Address.....

City.....(---) State.....

H-24

Hook 'em and cook 'em the Indian way



• Sneak up on the deep, dark pools where the big ones hide. It's easy in a perfectly balanced Old Town Canoe. This modern birch-bark is built for sportsmen. Steady and strong, yet light to carry. Made with Old Town skill to last for many a moon.

FREE CATALOG shows all kinds of canoes for paddling, sailing or outboards. Also outboard boats, including big all wood family boats. Sailboats. Rowboats. Dinghies. Address Old Town Canoe Company, 543 Wood Street, Old Town, Maine.

"Old Town Canoes"

USE YOUR BENCH SAW

FOR JOINTING & CUTTING MOULDINGS



With our six inch tool steel cutters make mouldings, casings, drop-leaf tables, grooves beading and jointing. Moulding cutters, A 1 in. wide \$1.75, 1 1/2 in. \$2.25. Jointing cutters, B 1 in. \$1.75, 1 1/2 in. \$2.25. E 1 in. for drop-leaf tables. \$1.75. E 1 1/2 in. Makes 3/4 in. cove & Quarter. \$2.25. Postpaid. Guaranteed. State size hole. List & Folder free.

JOHN A. SANDSTROM

Rt. 2-P.

Clearwater, Fla.



New Advertising Machine

**PRINTS and
ILLUSTRATES**

1c POST CARDS



**Send
Coupon**

**CARDMASTER CO., 4546 Ravenswood
DEPT. 163, CHICAGO 40, ILL. FREE!**

Send **FREE** Illustrated Book* and complete, unique advertising plans and money making ideas for my business.

*Shows HOW thousands of business men in every line are boosting sales in spite of conditions with 1c messages printed and illustrated in few minutes on gov't post cards—with amazing, new, patented **CARDMASTER**. Your "today's" ideas, read by your prospects next morning. Not a toy, but a sturdy advertising machine built to last years. Sold direct at low price. Guaranteed five years. **SEND NAME TODAY. All FREE!**

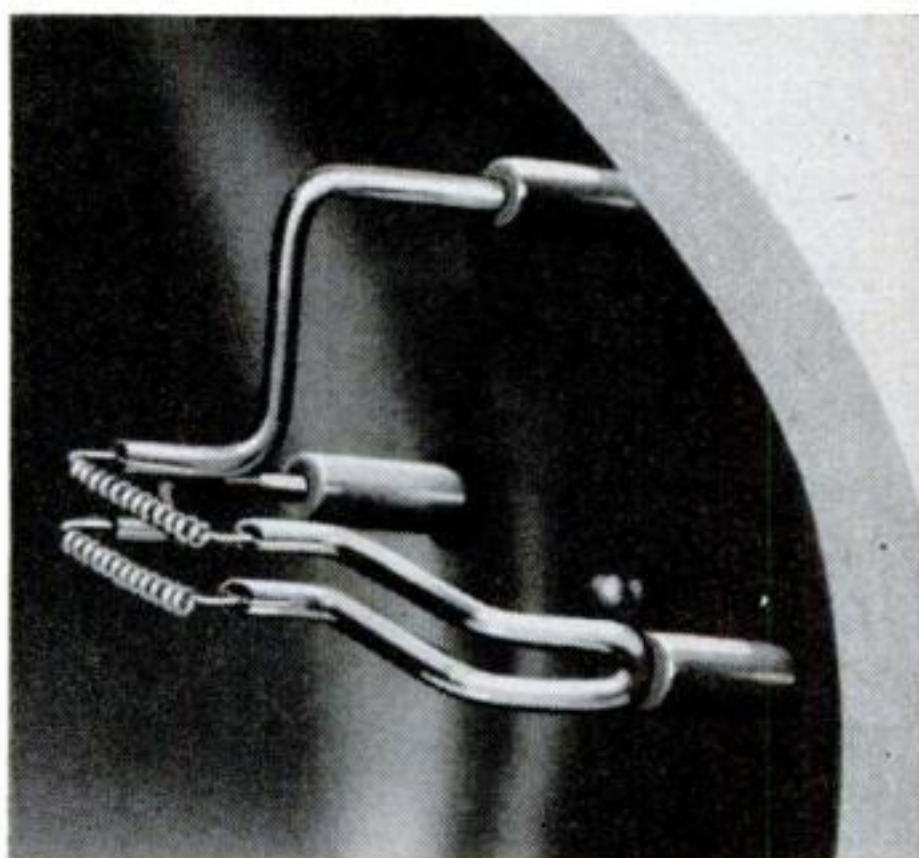
NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....

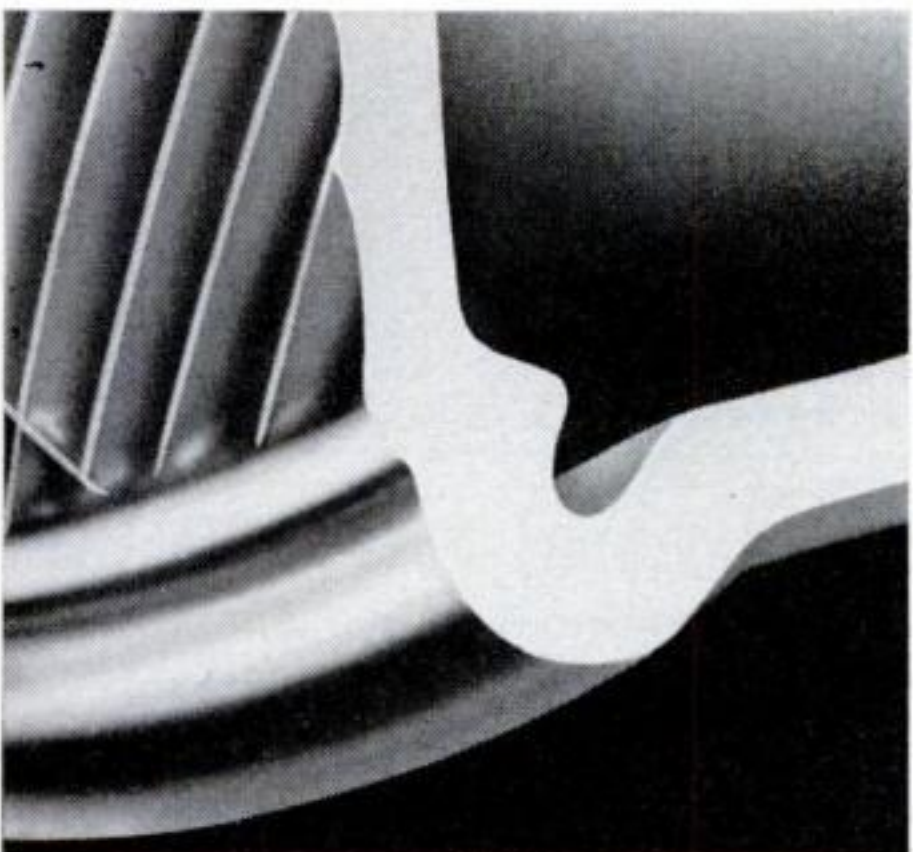
Why General Electric headlamps give more light

—now 12% more light on the road . . . and they do not grow dim

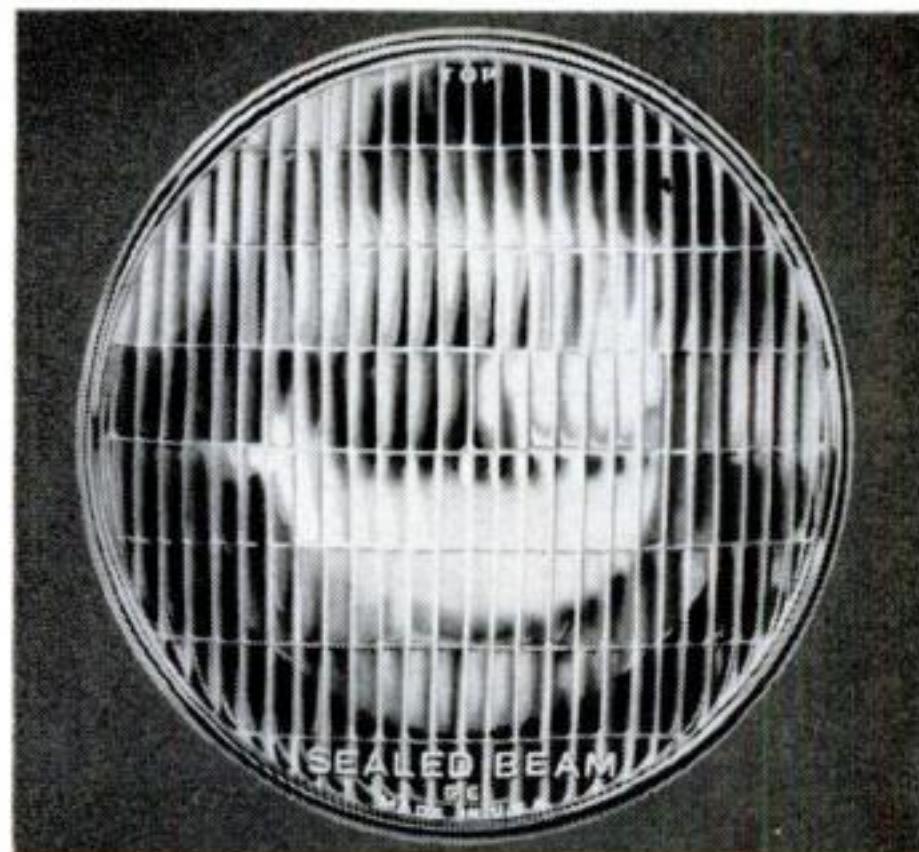


1. TODAY'S GENERAL ELECTRIC "ALL-GLASS" sealed beam Headlamp is a rugged, one-piece bulb that gives you more light than ever. These pictures show why.

2. BIG, IMPROVED FILAMENTS give 12% more light on the road for driving, 16% more light for passing. And they won't shake loose on bumpy roads.



3. THE ONE-PIECE, all-glass construction keeps out all light dimming dirt and moisture. The average General Electric headlamp gives 99% of original light output even at the end of its life. *It does not grow dim!*



4. THE LENS is rugged hard glass, precision made to put maximum light on the road. Be sure to have your car lights checked next time you leave your car for service. And when you need replacements, make sure you insist on General Electric!

You can put your confidence in—

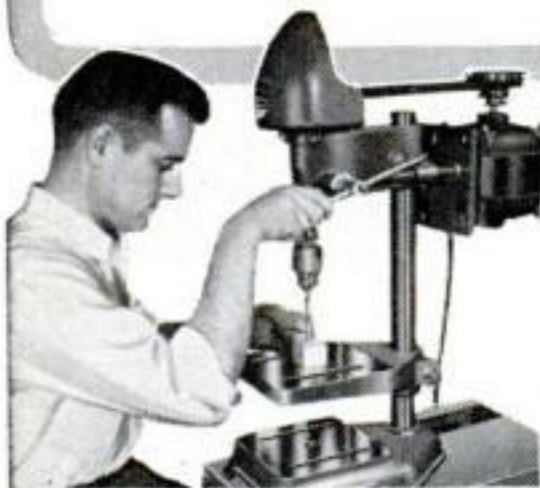
GENERAL  ELECTRIC

POWER KING 4½" JOINTER-PLANER

**EASY, EXPERT
WOODWORKING
FOR YOU!**



The smooth finish and tight joints that characterize professional woodworking can be yours at low cost with the Power King 4½" Ball Bearing Jointer-Planer. It saves you time and work in planing, rabbeting, tonguing, beveling. Built extra heavy, with massive cast iron base and table — ground table top — tilting fence — 3-blade steel cutter head — many other outstanding features. Made by the manufacturers of Atlas tools for industrial, commercial, and home shops. See it at your dealer's — buy it for professional results in your shop projects! \$44.75.



POWER KING 11¼" DRILL PRESS \$42.75

Another top tool value! Rugged, smooth, accurate. Drills wood, metals and plastics. Has low-cost accessories that help you get real "professional" results on such jobs as mortise and tenon joints, routing, shaping, sanding, carving, inlaying. Send coupon for complete information on this handy precision tool.

professional" results on such jobs as mortise and tenon joints, routing, shaping, sanding, carving, inlaying. Send coupon for complete information on this handy precision tool.

POWER KING 8" TILT/ARBOR SAWS \$61.75

All prices F.O.B. Kalamazoo, less motor. Subject to change without notice.



ATLAS PRESS COMPANY

342 N. Pitcher St., Kalamazoo, Michigan

**MATCHED PRECISION TOOLS FOR
WOODWORKING AND METALWORKING**

SEND FOR FREE LITERATURE TODAY

ATLAS PRESS COMPANY

342 N. Pitcher St., Kalamazoo, Mich.

Please send new Power King catalog to:

Name _____

Address _____

City, State _____

WAR SURPLUS BARGAINS



• **Power Plants.** 110-volt, 60-cycle, 2500-watt & 3000-watt sizes. Some types with remote switch starting. Easy to add automatic starting. Army's best plants with tools, parts, maintenance manuals. Ideal for farmers, sportsmen, contractors. Both new & used plants. Orig. cost over \$700 on 3000-watt. Some units low as \$199. Frt. prepaid. (Write for details.)

• **Marine Engines.** New single cylinder Briggs 3.5 h.p. air cooled, flame arrestor, thrust bearing. Easy to add automatic starting, shaft coupler. Ideal for fishing boats. Complete installation instructions. Standard price \$130. Our prepaid price only \$89.90 Same engine with Arnolt clutch \$99.90



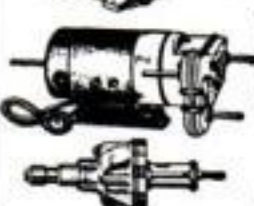
• **Power Pressure Sprayer.** Portable engine driven unit. Briggs 1½ h.p. engine, Westinghouse 2 cyl. compressor. Gauge, regulator, valves—complete. (No gun or hose.) Nearly new and guaranteed. Cost over \$250. Special prepaid \$99.50



• **Gas Engines.** Nearly new & excellent. Genuine Briggs ZZ 6.5 h.p. Useful tractors, grain elevators, weed & paint sprayers, pumps, scooters, saws. Cost \$140. Our freight paid price \$86.90



• **A-C Motors.** New 110-volt, 60-cycle, with marvelous speed reduction gear. Speeds of 8, 32, 320 & 4000 r.p.m. on four separate shafts simultaneously. Useful buffers, grinders, drills, coil winders, photo room, window displays. Cost over \$30.00. Our prepaid price \$8.75



• **Rotary Gear Pumps.** Precision unit. New condition. High vacuum and pressure. Dozens of uses. 1½ drive shaft. Full instructions. Cost \$36. Our prepaid price \$3.95

- DeLuxe Electronic Exp. Kits \$6.77
- Tulsa 6-ton Winches & Cable \$110.50
- \$40.00 W.E. Intercom, Phones, pair \$9.58
- \$30.00 Hydraulic Cyl. Pumps \$7.90

Order direct from ad or send for bargain catalog. We prepay all freight and P.P. We accept personal checks or send M.O. Our reference Natl. Bank of Comm. and 17 years in business in Lincoln.

LECO ENGINEERING CO.

Box 908 PS-16

Lincoln, Nebr.

NEWEST B-M POWER MOWER For Modern Lawn Care

Low
Factory
Price

Fully
Guaranteed

Some
Dealerships
Available



Model D-3

Newest addition to our family of fine power lawn mowers. Light, 3-wheel, rotary blade mower. Lifetime construction. Powerful 1½ h.p. 4-cycle engine. Self-propelled and other models available, including build-it-yourself Kit.

Write for Free Literature

B-M MOWER CO., Box 66-PS, Blue Mound, Kans.

DOUGLASS Steel-Pack MUFFLERS



**For All Makes
and Models**

ORDER NOW! Performance that excels • Stamina that endures Rugged construction. Steel tubing. Straight-thru design. Solid tube with steel packing. "Throbbing Deep Tone."

New complete Racing Equipment Catalog 25c Refunded With Initial Order			Complete for Easy Installation		
32-40 FORD V-8	\$5.96	29-48 CHEVROLET	\$5.96	31-41 PLYMOUTH	\$5.96
41-49 FORD V-8	6.85	42-48 PLYMOUTH	6.85		
39-49 MERCURY	6.85				
35-48 FORD & MERCURY DUAL SETS	\$23.00				
49 FORD & MERCURY DUAL SETS	25.00				

Specify Year and model • Satisfaction Guaranteed. Enclose Money Order or Check With Order. Send for Full Price List.
RACING EQUIPMENT CO. Dept. PS-3
1916 W. Valley Alhambra, Calif.

1/4-TON ARBOR PRESS

Ideal for straightening, bending, light stamping, riveting, staking, production assembly and general presswork. Used ten years in plants and shops—bushings, cameras, reels, typewriters, instruments, light molding, etc. Grey iron castings. Height 7½" over table 21½"; over base 43¼"; ram 5/16" x 7/16"; ram travel 2¼"; approx. pressure 500 lb. Weight 7 lb. See Your Dealer or Order Direct. No C.O.D.'s Please.

\$9.50 POSTPAID U.S.A., MONEY-BACK GUARANTEE
H. D. HERDER, Tool Specialties
2423 Brook Dr. KALAMAZOO 82, MICH.



**Steady
work . . .**

**big money
with
American**

BE YOUR OWN BOSS!

Now's the time to step out of the "hourly wage class"—and make **BIG PAY EVERY DAY** in a business all your own! Here's how—start a floor surfacing business with an American! Hundreds of men are doing this and making \$35 to \$50 a day—you, too, can make big money!

There's plenty of floor surfacing work all the year 'round in today's booming building industry. Pleasant, indoor work . . . sand both new and old floors. Easy to operate an American Sander—no big overhead—no large investment—no special schooling. Decide now that you want to get ahead and be your own boss!

Send for "money-making" booklet entitled "Opportunities in Floor Surfacing"—use coupon and enclose 25c in coin or stamps to cover handling.

AMERICAN

FLOOR MACHINES

The American Floor Surfacing Machine Co.
532 So. St. Clair St., Toledo 3, Ohio

Enclosed find 25c in stamps or coin for booklet "Opportunities in Floor Surfacing", telling me how I can start my own floor sanding business.

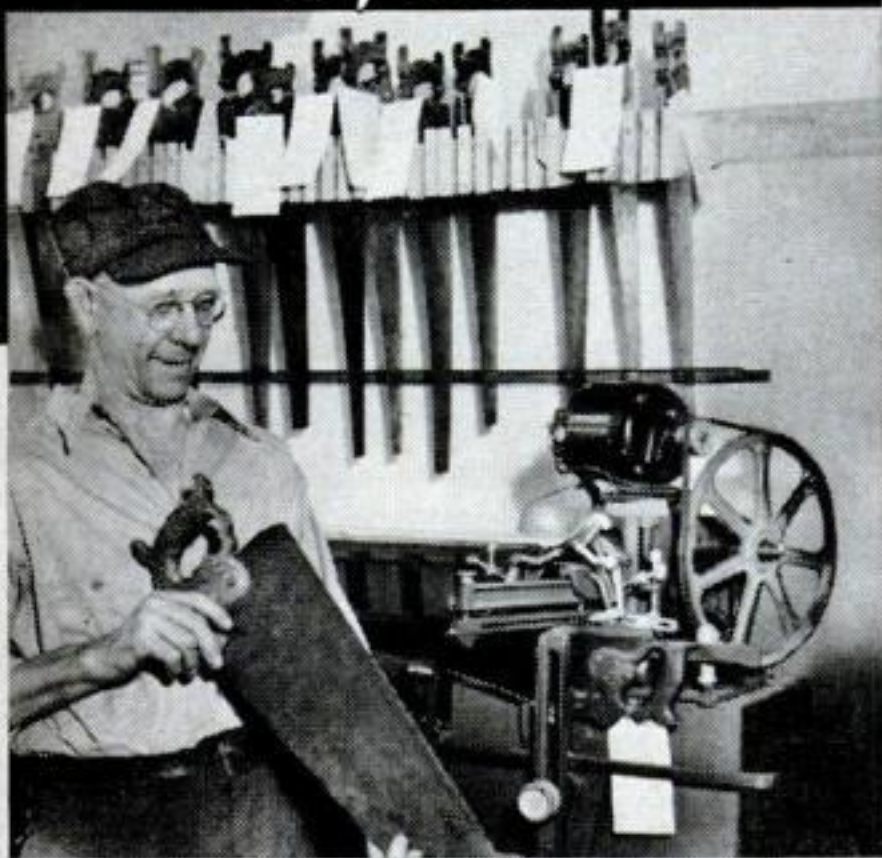
Name.....

Street.....

City.....State.....

Send Coupon Today!

**LAST YEAR'S PROFIT
\$3,000!**



with a
FOLEY SAW-FILER

"Last year's profit amounted to \$3,000. Not so bad for a one-man outfit"—from C. C. H., Penn. From Ohio J. B. W. wrote us—"I made \$765 last year filing saws, and it sure comes in handy. I do this work in my spare time". Men in communities of all sizes make up to \$2 or \$3 an hour with the Foley Saw Filer working full time or part time. That extra money comes in mighty handy in these days of high prices.

It's no trick to take care of the saw filing for your neighborhood hardware or lumber dealer—plus looking after the saws for farmers, townspeople, manual training departments and factories. The Foley files all hand saws, also band and cross-cut circular saws. It's a cash business, no canvassing, no eyestrain and no experience needed.

FREE BOOK
Shows How to Start

INDEPENDENCE AFTER 40 shows just how you can start at home in your spare time working in your basement or garage. It's an immediate cash business that can develop into a full-time repair shop.



Send for FREE BOOK

**FOLEY MFG. CO., 319-9 Foley Bldg.
Minneapolis 18, Minn.**

Send me free book "INDEPENDENCE AFTER 40".

Name.....

Address.....

THOUSANDS BUILD



START NOW!

**ROWBOATS, KAYAKS, DINGHIES, INBOARDS,
OUTBOARDS, RUNABOUTS, CABIN CRUISERS**



SEND 25¢ (COIN) FOR CATALOGS

Colorful Illustrations show all '49 Models, 8 to 23 Ft., and Construction Details.

U-MAK-IT PRODUCTS

MARINE DIVISION
Formerly Kayak Boat Co.
703R WHITTIER ST., N. Y. 59, N. Y.



MACHINE SHOP EQUIPMENT



• The 1949 edition of the famous Center Tool Co. Catalog is now ready! Every workshop owner should have a copy. 240 pages full of illustrations, descriptions, and prices of the latest tools made by best known manufacturers in U.S. You pay the cost of printing—50c. **We refund your 50c with your first order of \$10.00 or more.** Prompt delivery on most tools. Send check or money order to-day!

CENTER TOOL CO., 153 Centre Street, Dept. D, New York 13



New MILLING ATTACHMENT

Sizes for 8" to 16" metal lathes
Build it yourself from our sets of semi-machined castings and save \$\$. Can be finished on your lathe alone. Complete drawings and instructions furnished with castings. Mill keyways, slots, splines, dovetails, flutes in reamers, special cutters. Produce gears, ratchets, racks; bore, face, etc., with this precision attachment.

FREE! Illustrated folder and price list of castings, milling cutters, etc. Write to-day. Mention your lathe.

**HURON MACHINE AND TOOL CO.
YALE 2, MICHIGAN**



SEND FOR FREE FOLDER
**MULTI PURPOSE
POWER TOOL**

Magna Engineering Corporation
465 California St., San Francisco 4

Snap-on's Famous Ferret Set



Rugged tools . . . twice as strong as you would expect such slim, streamlined handles and thin-walled sockets to be.

"The Choice of Better Mechanics"



Present Owners:
Supplement your basic set with these Special Ferret tools . . .

Mechanics like this set because it is way over par in performance . . . the tools are strong and easily adaptable to a variety of jobs.

They squeeze into tight places and get those hard-to-reach nuts and bolts that defy the ordinary type wrench. Recently designed by Snap-on engineers, they have the new features that make fast, easy work of the tough jobs.

INCLUDED IN THE SET: $\frac{1}{4}$ " and $\frac{5}{16}$ " single broached sockets; 11 double broached sockets from $\frac{3}{8}$ " to $\frac{7}{8}$ "; a speeder wrench, sliding tee, 8" reversible ratchet, nut spinner and universal joint, plus a 3", 6" and 12" extension. All complete in a metal box for only **\$27.65**

CLUTCH-TYPE SCREW DRIVER



Handles clutch-type (figure 8) head screws. Built short for easy operation in close quarters.

RATCHET ADAPTOR



Converts any combination of Ferret handle, extension and socket into a reverse action ratcheting tool.

PLASTIC GRIP HANDLE



A shockproof, plastic handle, $5\frac{1}{8}$ " long that is ideal for electric work. Makes your Ferret Set more useful.

DOUBLE HEX FLEXOCKETS



Saves a lot of tough work fumbling for hard to get at studs and bolts. Eight sizes: $\frac{1}{8}$ " to $\frac{3}{4}$ ".



FERRET FLEXTENSION — A flexible steel cable extension connects handle and socket to work around corners and over obstructions.



EXTRA LONG FERRET SPEEDER

$36\frac{1}{2}$ " long, 27" shank. Radius of sweep is $3\frac{1}{4}$ ". "Palm-Grip" handle rotates to provide easy operation.

SNAP-ON TOOLS CORPORATION
8060-C 28th Avenue, Kenosha, Wisconsin

- Enclosed find ☐ check ☐ Money Order or ☐ Company Purchase Order for the \$27.65 Snap-on Ferret Set.
☐ Please send illustrated brochure describing 109 individual Ferret units.

Name.....
Address.....
City.....State.....

GROBAN'S—WAR SURPLUS BARGAINS

SHOP BY MAIL and SAVE
Better buys · Satisfaction guaranteed

HAND HYDRAULIC PUMP

Brand New

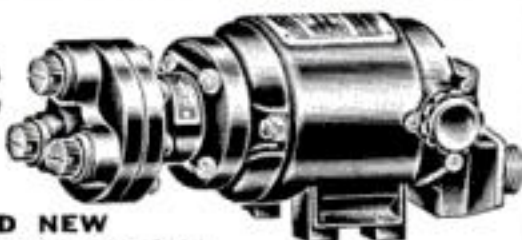
Used for hydraulic jacks, presses, hoists and other hydraulic applications. For operating hydraulic cylinders to pump oil or hydraulic fluid under pressure.



Hand pump has built-in check valve and is capable of delivering 1000 lbs. of pressure. Has alloy aluminum housing. Dimen.: 8" long x 3 1/2" high x 2 3/4" wide. Ship. wt. 3 lbs. A \$45.00 value. **\$8.95** Postpaid NOW

SELF-PRIMING ELECTRIC PUMP

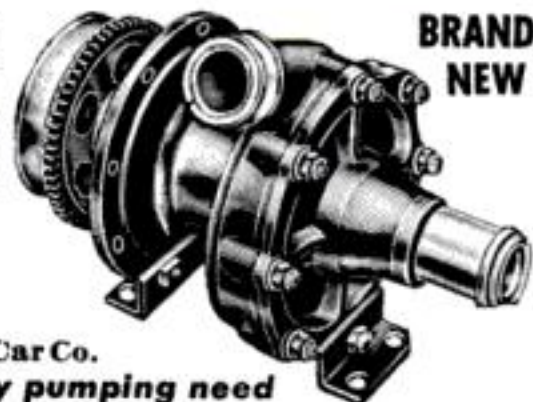
COMPACT—BRAND NEW



Applications: oil burners, aquariums, fluid metering, fuel pump, tool post grinder, coolant pump, pressure lubricating pump, general industrial, etc. Motor mfd. by Black & Decker; double ball bearing series wound, continuous duty, 1/30 H.P. electric motor, rated 12,000 R.P.M. Transformer included for use on 110 V AC current. Also applicable for 24-32 V DC. Pump mfd. by Weldon Tool Co. with standard 1/4" tubing ports; rated 2 G.P.H.; remove pump and use motor as high speed grinder. Overall dimensions: 7 3/4" long x 3 1/4" wide x 3 1/4" high. Approx. wt. 5 lbs. \$51.00 value. **\$12.95** Postpaid

ALL-PURPOSE WATER PUMP

BRAND
NEW



Mfd. by Packard Motor Car Co.

Ready for use on any pumping need

Use it for:
DRAINING BASEMENTS

Belt Driven

Centrifugal Pump

HOME WATER
SYSTEMS

FIRE PROTECTION

PRESSURE BOOSTER

IRRIGATION

DRAINING PONDS,
TANKS, etc.

SPRINKLING SYSTEMS

STOCK WATERING

INDUSTRIAL PUMPING

Complete with pulley
and mounting brackets,
ready for use.

An extraordinary value for all types of intermittent or continuous pumping in the home... farm... factory. Built to exact specifications of Packard Motor Car Co. for use in Rolls-Royce Merlin Aircraft Engines. May be run with electric motor, gas engine or power take-off on tractor. Delivers up to 25 gallons a minute with 1/4 H.P. motor; 80 gal. a min. with one H.P. motor. Will deliver up to 44 ft. head or 25 ft. suction. Use 1" outlet hose; 1" or 1 1/2" inlet hose (recommended).

Complete Engineering Reports and Operating Instructions Free with Pump. Has cast aluminum housing, accurately machined 5" bronze impeller; 3 1/2" V belt pulley and mounting brackets. Shaft rotates on ball bearing; has grease gun fitting.

Original cost approx. \$88.00. Shipping weight 10 lbs. **\$21.50** F.O.B. Chicago. A REAL BUY.

WRITE FOR OUR FREE CATALOG!

ORDER DIRECT FROM AD SATISFACTION GUARANTEED
Send payment or purchase order today

GROBAN SUPPLY CO.
1507 S. MICHIGAN AVE., Chicago 5, Dept. PS-3

GENUINE DIAMONDS SAVE UP TO 50% AND MORE

Iron-Clad Money Back Guarantee

SEND FOR **FREE** Diamond Catalog

Approx. 1/2 Carat Tax Incl. \$95
Retail Value \$200

The BERMAN Corp.
DIAMOND BROKERS
America's Great Diamond Values
DEPT. PS BERMAN BLDG., BALTO. 1, MD.

BERMAN'S
Illustrated
Catalog
OUT OF
PAWN
GENUINE
DIAMONDS
VALUES FROM \$10 TO \$10,000

Build This Model of Elizabethan Galleon "Revenge"

• Complete detailed plans for handsome Galleon Model, 25 in. high, 30 in. long overall, only \$1.25. Order Blueprint No. 206. FREE catalogue with your order! Address Popular Science, Dept. 39, 353 4th Ave., New York 10, N. Y.



Distributorships
Available

ORDER TODAY!

COLD SUFFERERS

Extensive tests in hospitals and clinics have proven the effectiveness of TRI-ETHYLENE GLYCOL in preventing colds. Health-O-Lator is the most efficient and economical dispenser of this wonderful new germicide on the market. Complete with six months supply of glycol—\$29.95 (Refills \$1.40) C.O.D. plus postage. Cash orders sent pre-paid.

HEALTH-O-LATOR CO.

8845 W. Olympic Blvd., Beverly Hills, Calif.



**Treasure and Mineral
LOCATORS
GEIGER-COUNTERS
FOR URANIUM-ORES**
CREDIT PLAN—FREE LITERATURE
FISHER RESEARCH LABORATORY Inc.,
Palo Alto, Calif.

FREE PLANS POWER MOWER KITS FREE PLANS

Have one of the finest mowers money can buy. Write for FREE PLANS and PARTS LIST showing you how to SAVE up to 75% by assembling Triangle's POWER MOWERS.

SPECIAL FACTORY PRICES
Kits, Parts, Engines, Wheels, Etc. Also complete TRIANGLE MOWERS ready to mow, at Low Factory Prices. 3 and 4 wheel Models.

3 WHEEL MODEL 4 WHEEL MODEL

SAVE your back. Assemble or build your own 3 or 4 wheel power mower with our precision made kits and parts. Write today for full facts, Free Plans, Parts List, Low Factory Prices. DEALERS INVITED. TRIANGLE MANUFACTURING CO., Dept. S-1, Box 185, Fort Scott, Kansas

FENCE with your Musketeer Fencing Set!



The sport of heroes. Active, developing alertness, speed and agility. Become a Champion fencer. Set contains pair of 3 ft. spring steel foils (swords) and FREE instruction book by former OLYMPIC COACH. ONLY \$1.98 Postpaid. Send Check or M.O. today. Satisfaction Guaranteed!

CASTELLO, Dept. P.S., 232 E. 9th St., N. Y. 3, N. Y.

E-Z SHINE
Shoe Holder
For shining all shoes. Guaranteed. Our famous self-polishing shoe cloth 10c ea. additional.

\$2.50

WITH CHECK OR MONEY ORDER. (C. O. D.'s EXTRA)
WAYNE MFG. CO. WAYNE 7, PA.

GROBAN'S—WAR SURPLUS BARGAINS

SHOP BY MAIL
and SAVE
Better buys • Satisfaction guaranteed

MINIATURE High Speed ELECTRIC MOTOR

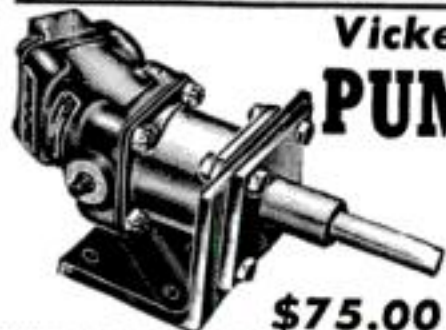
IDEAL FOR MODEL BUILDERS, MODEL RAIL-ROADERS, EXPERIMENTERS, HOBBYISTS. AC or DC. Reversible, speed may be regulated by varying voltage. Has miniature Klixon thermostatic switch. All connections are external and accessible. Has 3 mounting feet for easy installation. Double-end ball bearing supported shaft with small gear on one end. Die-cast housing with laminated field. Overall Dimen.: 3 1/4" long x 2 3/8" wide x 1 3/4" high. Net wt. 12 oz. A \$22.00 value.



Brand New
\$2.95 Post-paid

AIR FORCE WOOD PROPELLER

Decorate your den, trophy room, office, clubroom with a BRAND NEW Genuine Air Corps Propeller. Made of polished laminated hard wood, 6 ft. long. Ship. wt. 75 lbs. GOV'T F.O.B. ACQUISITION COST \$112.00. NOW ONLY \$12.95 Chicago



Vickers MF9 Hydraulic PUMP or MOTOR

complete with mounting kit ready to install

\$75.00 value
\$19.90 post-paid

Pump is compact, powerful, rated 1,000 P.S.I., .507 cu. in. per revolution, 8 gal. per min. at 3750 RPM. Change rotation by reversing flow. Delivers up to 6 H.P. Requires 1/3 to 6 H.P. to drive directly or by pulley. BRAND NEW. Mounting kit has been especially designed to provide maximum utility and ease of mounting MF Series Vickers Pumps. Brackets are constructed of heavy steel plate; shaft is made of 1/2" steel with one end splined to fit pump; other end of shaft has machined flat for mounting a standard pulley with 1/2" hole. Shaft runs in oilite bronze bearings.

Pump only \$14.95 postpaid
Mounting kit only \$ 4.95 postpaid
Both as complete unit \$19.90 postpaid

HYDRAULIC PRESSURE GAUGE

BRAND NEW

Ideal for high hydraulic systems, adjusting pressure, relief valves, etc. Range 0 to 2000 P.S.I. Black plastic case 2 3/8" square, 1 3/4" deep. Black instrument face with white pointer and numerals. Worth many times this low price of

\$2.95 post-paid



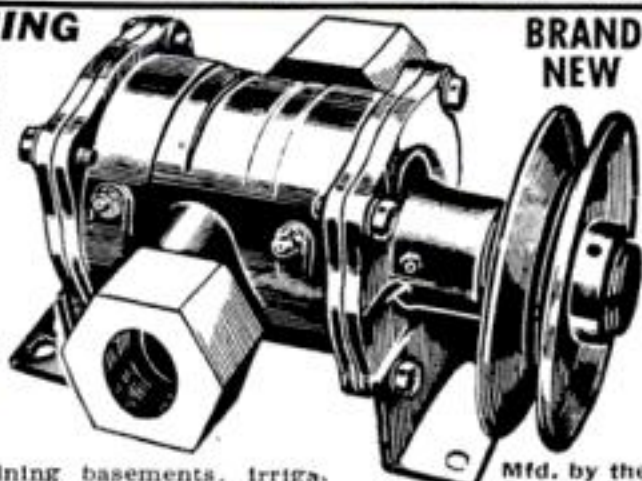
ADJUSTABLE RELIEF VALVE.....\$2.95 postpaid

FREE: New, 20-page illustrated Hydraulic Manual featuring diagrams, photographs and instructions—FREE with each hydraulic order.

SELF-PRIMING

BRONZE PUMP

Positive
Pumping
Pressure



BRAND NEW

Mfd. by the
Pump Division
Eaton Mfg. Co.

\$32.50 F.O.B. Chicago

Perfect for draining basements, irrigation, fire fighting, sprinkling, pressure booster, insecticide and other spraying, fuel transfer, stock watering, industrial pumping, deep well jet pumping and home water systems. Rated 25 ft. suction and 150 ft. head pressure at 80 gallons. Use from 1/3 to 5 H.P. motor.

COMPLETE ENGINEERING REPORT AND INSTRUCTIONS FREE WITH PUMP
Supplied with mounting brackets and 5" V belt pulley, ready for instant use. Standard 1 1/2" pipe thread inlet and outlet. Dimensions: 9 1/2" x 7 1/4" x 4 1/4". Ship. wt. 18 lbs. A \$142.00 value.

BRAND NEW—AIR OR OIL

HYDRAULICS

Use hydraulics on arbor presses, hydraulic presses, hay lifts, manure loaders, lift trucks—push or pull, tilt or turn, press or squeeze, open or close, lift or lower—and other hydraulic and industrial applications. Use with either air or oil . . . of finest precision workmanship.



1 Double action, 1 1/2" bore, 5" stroke, will lift 1760 lbs. in one second with Vickers MF9 Pump. Wt. 3 lbs. A \$35.00 value. \$8.95 post-paid

2 Double action, 1 1/2" bore, 9" stroke, will lift 1760 lbs. in one second with Vickers MF9 Pump. Wt. 4 lbs. A \$45.00 value. \$10.95 post-paid

3 Use these cylinders on farm trucks, bulldozers, hay lifts, manure loaders, etc. Double action, 1 1/2" bore, 27" stroke. (Will lift 1760 lbs. in 2 seconds with Vickers Pump.) Wt. 8 lbs. A \$55.00 hydraulic cylinder value for only. \$12.95 post-paid

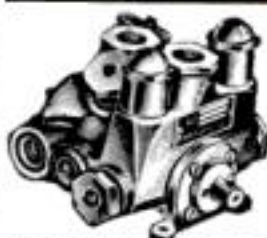
4 Double action, 2 3/8" bore, 8" stroke. (Will lift 4400 lbs. in one second with Vickers Pump.) Will withstand 1500 P.S.I. against wall. Wt. 7 lbs. A \$65.00 value. \$14.50 post-paid

5 Double action 2 3/8" bore, 5" stroke, two-way solid 3/8" alloy steel shaft (will lift 4400 lbs. in one second with Vickers Pump). A \$73.00 value. \$16.50 post-paid

6 Double action, 3" bore, 10 1/2" stroke. All steel hydraulic cylinder, will lift up to 12,000 lbs. (7000 lbs. in 3 seconds with Vickers Pump.) Complete with fittings. Wt. 12 lbs. A \$78.00 value. \$19.50 post-paid

7 Double action, 3 1/2" bore, 11" stroke. (Will lift 9600 lbs. in 7 seconds using Vickers MF9 Pump.) Complete with fittings. Wt. 15 lbs. A \$92.00 value. \$22.50 post-paid

Fittings available for above cylinders.



HYDRAULIC CONTROL VALVES

BRAND NEW

1 Four-way control valve with built-in relief valve, for use with double action hydraulic cylinder, may be used with 1500 P.S.I. hydraulic system to open and close hydraulic cylinders. Brand new. Ship. wt. 4 lbs. A \$38.00 value. \$7.95 post-paid

2 Four way control valve for use with two hydraulic double action cylinders. Each cylinder may be operated independently of the other or in conjunction with the other. Oil may be locked in any of the cylinders to hold the piston at any required position. Brand New. Ship. Wt. 6 lbs. A \$60.00 value. \$10.95 post-paid

3 A two cylinder double action valve with a unique arrangement, allowing the operator to raise both cylinders simultaneously, to lower them simultaneously or to raise one and lower the other at any predetermined rate and speed. Brand New. Ship. Wt. 8 lbs. A \$75.00 value. \$14.95 post-paid



VICKERS HEAVY DUTY HYDRAULIC PUMP

BRAND NEW

For tractors, bulldozers, construction machinery, lift trucks, industrial applications, etc. Used on Ross Carriers. Delivers 18 gal. per minute at 1000 P.S.I. at 1200 R.P.M. using 10 H.P. Has 1 1/2" intake; 1 1/4" outlet; threaded and keyed 3/4" shaft for direct or pulley drive.

Wt. 40 lbs. Dimensions: 5 3/4" diameter, 7 1/2" high. Original value \$148.00. NOW \$39.50 F.O.B. Chicago

VICKERS HEAVY DUTY HYDRAULIC CONTROL VALVE

Brand New. This Vickers heavy duty 4-way control valve, Part C-2330, is ideal for use with the Vickers Heavy Duty Pump for double action cylinders. Has built-in relief valve with 50 to 1000 lbs. per sq. in. overload adjustment; max. capacity 24 GPM; pressure inlet connection from pump 3/4" pipe thread; cylinder connections 3/4" pipe thread; discharge connection to tank 1 1/4" pipe thread; Over. dimen.: 8 3/4" W x 10 1/2" L x 7 5/8" H. Ship. wt. 54 lbs. ORIGINALLY COST MANY TIMES MORE. NOW \$24.95 F.O.B. Chicago

WRITE FOR OUR FREE CATALOG!

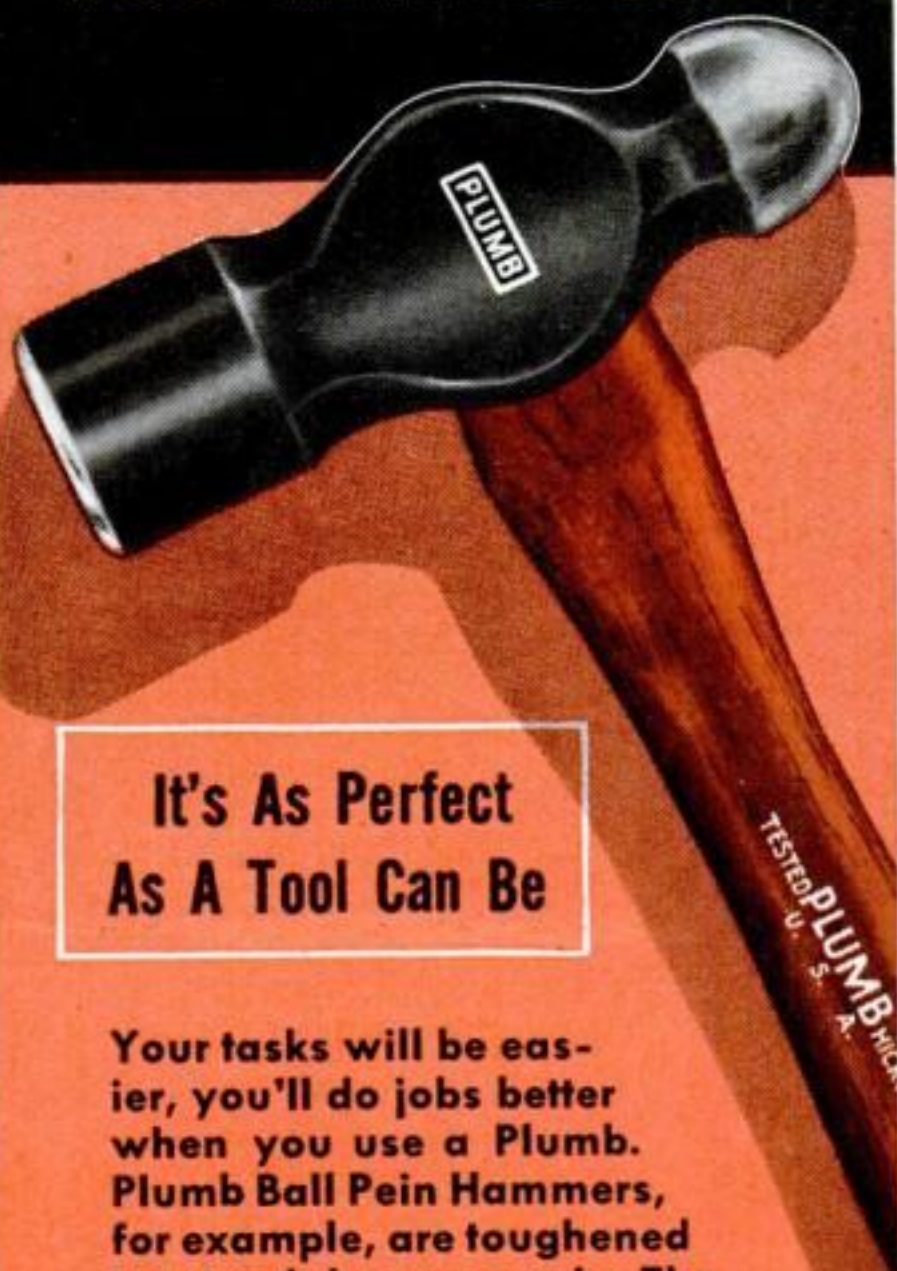
ORDER DIRECT FROM AD
Send payment or purchase order today
SATISFACTION GUARANTEED

GROBAN SUPPLY CO.

1507 SOUTH MICHIGAN AVE.

Chicago 5, Ill. Dept. PS-3

**WHEN IT'S A
PLUMB
YOU CAN BE SURE**



**It's As Perfect
As A Tool Can Be**

Your tasks will be easier, you'll do jobs better when you use a Plumb. Plumb Ball Pein Hammers, for example, are toughened to stand heavy work. The weight is centered behind the striking face to add force to the blow. Cone-shaped pein spreads rivets instead of mashing them. Tested hickory handles are shaped to lessen fatigue. Like all Plumb Tools they are balanced to make hard jobs easy—to do work faster.

Fayette R. Plumb, Inc., Phila. 37, Pa.

The red handle and the black head
—exclusively Plumb

PLUMB

HAMMERS • HATCHETS • AXES • FILES

**Build YOUR OWN
LOG CABIN!**

**\$425 to
\$5,000**



*Big
Savings*

Shipped In Sections—Ready to Erect

Build your log cabin yourself and save money! Braun Cabins (Patent No. 2320466) come to you prefabricated in sections, lettered and numbered—easy to erect. Beautiful Michigan White Cedar vertical half-logs. Weathertight joints. Interior—knotty cedar. Many designs to choose from, as low as \$425, F.O.B. Detroit—or we can adapt our material to your plan, FHA approved Prompt shipment. Send 25c for 24-page Catalog, including overnight and guest cabins.

BRAUN LUMBER CO.
CEDAR CABIN DIVISION
1573 E. Davison Detroit 3, Mich.

*Send
25c for
Catalog*

BRAUN CEDAR CABINS

WORLD'S LOWEST PRICED ADDING MACHINE

**VEST POCKET SIZE
IDEAL for BUSINESS & PERSONAL USE!**

**FREE TRIAL
ONLY \$2.95**

**TOTAL
COST**

SEND NO MONEY

FREE!!
Each Baby Calculator in Beautiful, rich-looking Leatherette case—at no extra cost.



Fits vest pocket or purse. Guaranteed accurate. Operated as easily, and as reliable, as machines costing many times as much. Not a toy. Precision made, very durable—guaranteed for life against defects in construction. You positively can't buy a calculator of equal quality for as little money. **ACCEPTED AS THE FINEST LOW PRICED CALCULATOR FOR OVER 35 YEARS!** Operates with a flick of your finger. Adds, subtracts, multiplies, divides—counts up to one billion. Pays for itself over and over in mistakes avoided, and time saved.

MAKES IDEAL GIFT

Sold on a positive money back guarantee. Send only \$2.95. Calculator sent postpaid, or send name and address and pay postman \$2.95 plus postage. **MONEY BACK IN 10 DAYS IF NOT DELIGHTED!** (If outside U. S., send \$3.50.)

AGENTS WANTED

CALCULATOR MACHINE CO., (Mfrs.)

Dept. 510, P. O. Box 248, Glenview, Illinois

Takes less than 3 hours to Convert HAND MOWERS TO POWER MOWERS

- Handy-Dandy Lawn Mower Kit fits any hand mower from the 16 to the 20 inch size.

- Kits furnished separately or with power units.

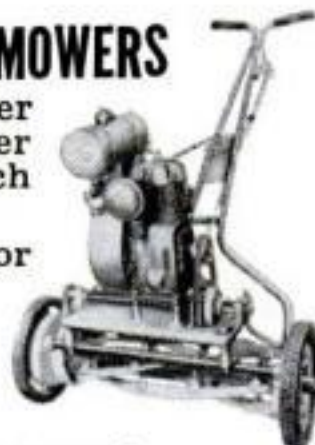
AVAILABLE

Kits available for Power Products, Maytag, Lauson, Briggs Stratton, Clinton, other small gas engines or electric motors. In stock $\frac{3}{4}$ or $1\frac{1}{2}$ h.p. Lauson engine and 19" heavy duty Pennsylvania Mowers.

DEALERS WANTED

LE CLAIRE MANUFACTURING CO., LE CLAIRE, IOWA

Dept. P.S. 150



Here's your **GO** sign to good times

HARLEY-DAVIDSON
with the new **HYDRA-GLIDE FORK**



Every bend in the road brings new fun and thrills . . . every highway leads to new adventures when you're riding a super-smooth Harley-Davidson in the world's greatest sport . . . motorcycling! There's no end to enjoyment, no lack of places to go and things to do. Delightful gypsy tours, exciting race meets, endurance runs and hillclimbs . . . sightseeing trips to scenic splendors and historic places all beckon you to happy days and endless good times. Owning a Harley-Davidson is easier than you think. See your dealer today, and mail the coupon now.



HARLEY-DAVIDSON MOTOR COMPANY
Dept. PS, Milwaukee 1, Wisconsin

Send free copy of **ENTHUSIAST** magazine, filled with motorcycle action pictures and stories; also literature on latest models.

Name.....

Street or R.F.D.....

City.....Zone.....State.....



MARCH 1949 267

Evinrude gives you

*Tops in
fishin' fun*



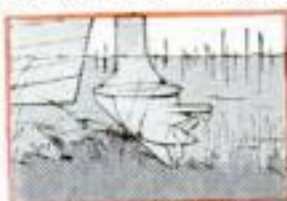
WITH THE REVOLUTIONARY

Fisherman Drive

... takes you anywhere there's water to float your boat!

Yes... with this patented Drive you can go "anywhere there's water to float your boat." And what a difference *that* makes to your boating and fishing fun! No longer need you dodge reeds and weed beds! Or hurriedly cut the power over shoals, snags, rocks! There's *nothing like it* for carefree boating in all waters!

SEE YOUR EVINRUDE DEALER... and see the complete line of 40th Anniversary models... 1.5 to 50 horsepower... *the right motor for every boat!* Look for your dealer's name under "Outboard Motors" in the yellow pages of your phone directory. For free catalog write EVINRUDE MOTORS, 4248 N. 27th St., Milwaukee 9, Wisconsin.



through weeds



over snags



over shoals



FREE Write for full-color catalog of complete line—gives helpful information on features, boats, speeds.

In Canada: Evinrude Motors, Peterboro, Ontario

EVINRUDE

FIRST IN OUTBOARDS • 40th YEAR

268 POPULAR SCIENCE



NEW Catalog

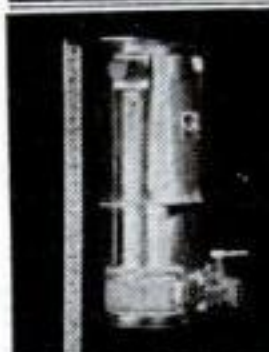
ATTACHMENTS AND ACCESSORIES FOR LATHES

Describes equipment that will make your lathe more versatile, such as:

Milling Attachments	Center and Steady Rests
Taper Attachments	Steel and Brass Collets
Bed Turrets	Collet Attachments
Electric Grinders	Chucks, Tools, etc.

SOUTH BEND LATHE WORKS, 456A E. MADISON ST., SOUTH BEND 22, IND.

WRITE FOR CATALOG 77-U TODAY!



HEATERS \$9.95 CLOSE-OUT

Gasoline burning, Stewart Warner, 40,000 BTU. Adaptable to small bldgs., boats, trucks, buses, etc. 6-volt \$9.95; 12-volt \$14.95; 24-volt \$15.50; 110-volt \$19.95. FOB Wash., D. C. Weight 19 lbs. Crated wt. 40 lbs. All brand new. Operating instructions included with order.

MICHEHL INDUSTRIES Cunningham Drive
Wheaton, Md.



MELLO-TONE MUFFLERS Duals and Singles

Give your car that "Mello-Tone" with a new all-steel-packed, straight thru muffler. Scientific construction reduces back pressure, saves gas, increases power. V-8 and Mercury Duals '35-'48 \$20, set. '49 Merc. or Ford Duals \$23. Singles \$4.95-6.25. Chrome tailpipe extensions—2½"—\$2, 3"—\$2.50. Check or money order, \$2, dep. C.O.D.'s.

Send 25c for current catalog and future mailings—free with order. 111425 Wash. Pl., Culver City, Calif.

Make Your Own BAND SAW REPAIRS



Complete Bandsaw
Brazing Set

\$10.50

Postpaid

Save time and money with this handy new repair outfit. Sturdy steel jig (8" x 11½" x 1½") holds 1/8" to 1/2" saw. Fits bench or vise. Complete outfit includes jig, standard alcohol torch, silver solder, flux and directions. Quick and easy to use. Send check, M.O. or C.O.D. MONEY BACK GUARANTEE.

Royal Specialties Co. Dept. P53
No. Royalton, Ohio

BLACK ORNAMENTAL HARDWARE BY STANLEY

Reg. U.S. Pat. Off.



FREE Idea Booklet shows where and how to use this attractive, new hardware. Styled from original Colonial and Early American pieces. 16 pages of helpful information. See your hardware dealer or use coupon below.

The Stanley Works, New Britain, Conn. Dept. PS

Please send me "Idea Booklet".

Name.....

Address.....



HARDWARE • HAND TOOLS • ELECTRIC TOOLS • STEEL STRAPPING



**DELTA
MILWAUKEE**

- Ideal for:*
- Maintenance Departments
 - Shipping Departments
 - Display Companies
 - Sign Shops
 - Schools
 - Home Workshops
 - Woodworking shops of all kinds

NEW

DELTA® 8" Tilting-Arbor Saw

**Does all circular-saw work . . .
quickly, easily, accurately**

A compact floor model — fits in small space. Takes maximum vertical cut of 2-5/16". Welded steel cabinet is of 18-gage metal. Big 25" x 33" cast-iron table — heavily ribbed for rigidity. 12" working surface in front of blade at maximum cut. Rip fence extends from front to back of table. Set-over feature of guide rails increases rip capacity at right of blade from 20" to 27". Convenient hand-wheel controls. Adjustable table insert. Auto-set miter gage. "Super-safe" saw guard. Universal motor bracket takes any frame motor. Price, \$149.50, without motor and switch—subject to change without notice.

Have your nearby Delta distributor show you this new Delta 8" Tilting-Arbor Saw. And have him tell you how you can get it on easy credit terms. See him now.

Look for the name of your Delta distributor under "Tools" in the classified section of your telephone directory.

Free Bulletin AD-455! Pictures and describes the new Delta 8" Tilting-Arbor Saw, feature by feature. Shows why Delta quality construction means longer saw life and greater operating satisfaction.

Also available without charge is Delta Catalog B-48—a handbook of woodworking machines. Request both, by coupon below.



TEAR OUT COUPON AND MAIL TODAY!



DELTA MANUFACTURING DIVISION
Rockwell Manufacturing Company
682C E. Vienna Avenue
Milwaukee 1, Wisconsin

Send me free copies of Bulletin AD-455 and Catalog B-48.

Name.....

Title.....

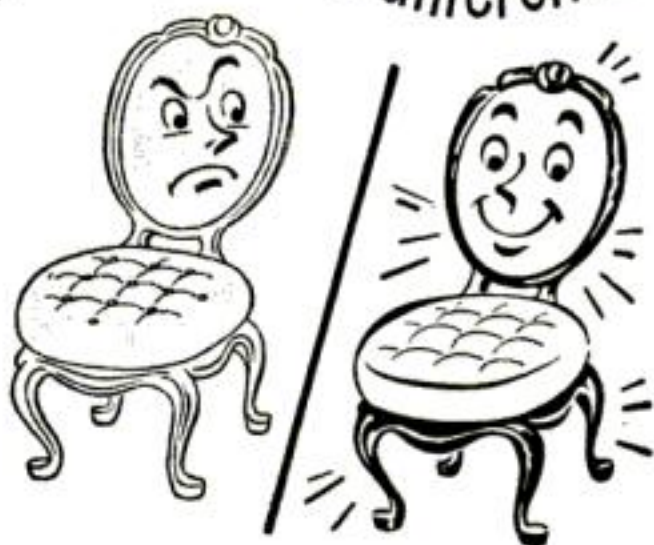
Company.....

Address.....

City..... (.....) State.....

HM-66

What makes the difference?



LIN-X

CLEAR-GLOSS VARNISH

Yes, and what a difference! That clear, tough, long-lasting coat of Lin-x Clear-Gloss Varnish protects and beautifies floors, woodwork, furniture, printed linoleum, boats, countless other surfaces—resists boiling water, sizzling cooking greases, alcoholic beverages. And so EASY to use—just brush it on!



At your paint, hardware and department store!



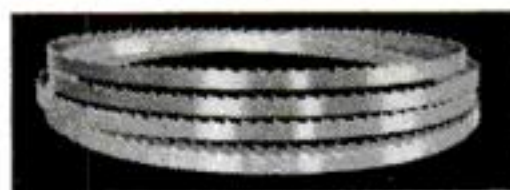
Distributed by

Acme White Lead & Color Works, Detroit • The Lowe Brothers Co., Dayton • John Lucas & Co., Inc., Philadelphia • The Martin-Senour Co., Chicago Rogers Paint Products, Inc., Detroit • The Sherwin-Williams Co., Cleveland

Electrically Welded Endless

Paramount

BAND SAW BLADES



Made in widths from 1/8" to 1-3/4"

Make your band saw do more work for you. The proper width of blade will extend the scope of this important machine. Burrill's Paramount Blades are made from tough Nickel Alloy Steel properly tempered. Teeth accurately set and filed, and all saws carefully straightened. Send order and check today. Delivery will be made as promptly as conditions permit, from a few days to a week or two. You can obtain these saws at the following prices:

1/8"-3/16"-1/4"-3/8" wide, 5'6" long.....	\$1.04 each
1/8"-3/16"-1/4"-3/8" wide, 6'6" long.....	\$1.16 each
1/8"-3/16"-1/4"-3/8" wide, 7'6" long.....	\$1.27 each

Other sizes at proportional prices

NO C.O.D. SHIPMENTS ACCEPTED

State Make of Machine

Your satisfaction is guaranteed

BURRILL SAW & TOOL WORKS

405 E. Main St., Ilion, N.Y.

With a Crosman . . .

YOU SHOOT ACCURATELY!



These well balanced Crosman pneumatic pistols and rifles shoot with smooth, snappy, correctly engineered compressed air power . . . controllable for moderate to extreme velocities. Barrels are micro-precision rifled. Sights are accurate, finely adjustable. Trigger action is smooth and crisp. And, you're always in form: with Crosman controllable power and low-cost Crosman Super-PELL ammunition, you do more shooting, anytime . . . indoors or out. At your dealers. Send for illustrated catalog.



CROSMAN ARMS COMPANY, INC.
9 HENRIETTA STREET • ROCHESTER 7, NEW YORK

JUMBO HEAVY DUTY JACK KNIFE
15 5/8" OPEN
14 Ozs.



Handy around

- ORCHARDS
- SHOPS
- SHIPPING ROOMS

Great for HUNTERS, TRAPPERS, SCOUTS, CAMPERS, etc.

Check or M.O. | Gun Metal **\$2.95**
| Chrome Plated **\$3.95**

JUMBO JACK KNIFE CO.

2432 W. 28th ST., GRAND RAPIDS, MICH.

WALTHAM
16-JEWEL (RUBIES)



The Watch that
timed Army Air
Corps Pilots

SEND NO MONEY
Use Coupon

U. S. ARMY Air Force Type A-11

WALTHAM WRIST WATCH

Guaranteed

- 15 Jewel
- Dust Proof
- Shock Absorbent
- Water Repellent
- Sweep Second Hand
- Precision Movements
- Unbreakable Crystal
- Non Magnetic Hair Spring
- Stainless Steel Back—
- Chrome Case

NOW...at about one-third regular Market Price, ONLY **\$19.95**

Plus 10% Fed. excise tax

SHACKELFORD'S, Dept. 209, 332 East 31 Street, Kansas City 8, Mo. Please send me the Army Air Corps WALTHAM WRIST WATCH. I will pay postman on delivery \$19.95 plus 10% Fed. tax and COD fees.

Name.....
Street.....City.....State.....

LUMBER

A BOARD
OR A
CARLOAD

TOP
GRADE
KILN
DRIED

BIG NEW 144 PAGE CATALOG

of hard to find woodwork items, hardware and supplies; the finest craftsman catalog Harold Hunt ever published—32 rare and fancy woods in natural colors—also in color, 43 matched veneer designs, multi-colored bindings, inlays, overlays, shows over 275 scroll patterns to choose from.

CRAFTSMAN WOOD SERVICE CO.

2729 S. Mary St.

Dept. B-3

Chicago 8, Ill.

Unequaled
Bargains

Walnut
Mahog.
Cherry
Maple
Wh. Hard
and Soft
Poplar
Pl.-Qtr.
Oak
Aromatic
Red
Cedar

Save Money-Make Money
with **LARSON Leathercraft**

For gifts or for sale—make easy-to-assemble leather items. Complete stock leathers, tools, accessories.

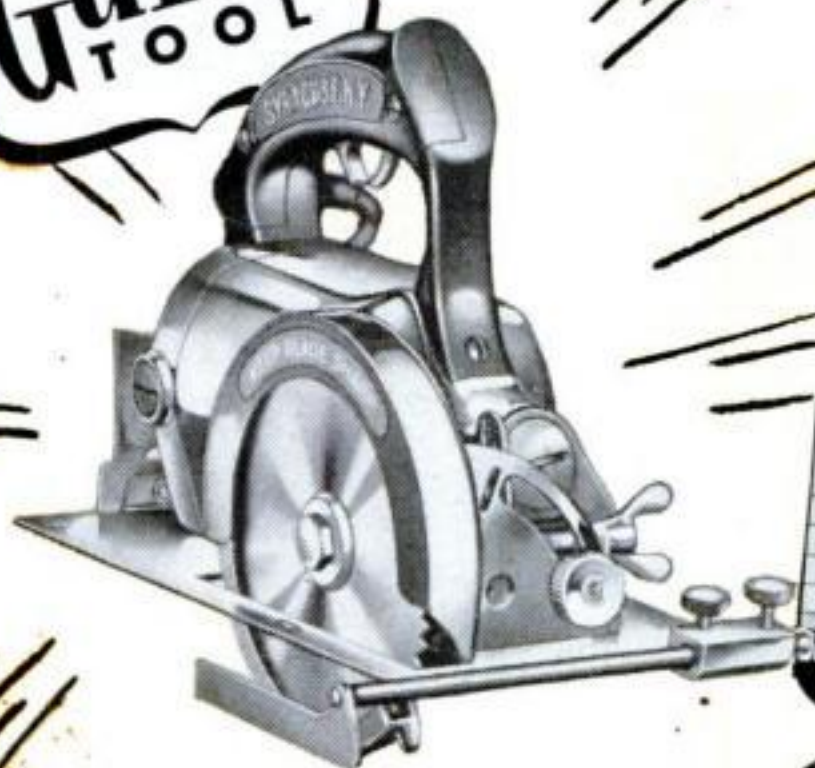
Send ten cents for new catalog of 101 money-making ideas.

J. C. LARSON CO.

826 S. Tripp Ave.
Chicago 24, Illinois

EASIER Sawing

5 to 10 Times Faster!



PRICE ONLY

\$49.50

The Guild Saw actually saves you hours of back-breaking work in the home, on the farm, in light industrial use. It cuts in 5 minutes what would take you at least 30 minutes or more to do with a hand saw! Operates in any position . . . does everything a hand saw does . . . and then some. And—it's inexpensive!

EASY-TO-USE — Makes all kinds of cuts. Blade lowers and raises for cuts ranging from a scratch to 1 1/4" deep. Blade also tilts for bevels and compound mitres up to 45°. It's a beauty. Quality-built throughout for men who appreciate good *professional* - type tools. *Weights less than 7 lbs!*

SEE Guild Tools today at leading hardware, mill supply and lumber dealers. Or, write for name of your nearest dealer and *free* literature.



Mitres



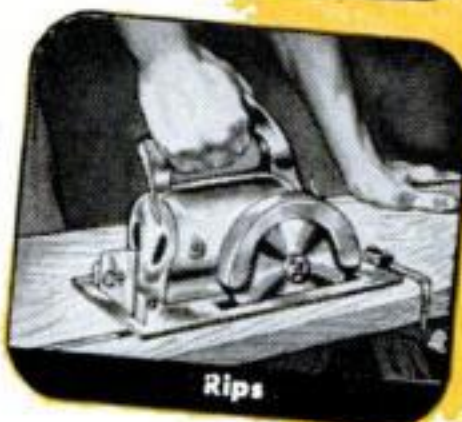
Dados



Cuts overhang



Cuts Tenons



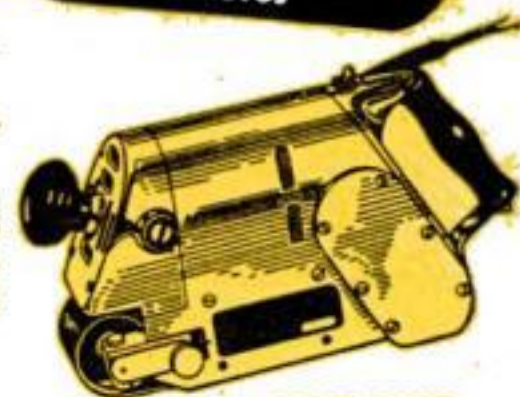
Rips



Grooves

EASIER SANDING!

**Up to 10 Times
FASTER!**



GUILD SANDER

Uses abrasive belts in variety of grits to sand flat or curved surfaces on wood, plastics, metal and stone. Does refinishing of furniture. Cleans up mars and blemishes. Removes old paint and varnish. Smooths down glued joints.

Operates in any position—vertical, horizontal or overhead. Runs in a vise for sharpening tools and grinding.

Weights only 12 lbs. Belt is 2" x 21" and can be changed almost instantly.

PRICE ONLY
\$59.50

PORTER-CABLE Machine Co. 2003 N. Salina St., Syracuse, N.Y.
Manufacturers of Speedmatic and Guild Electric Tools



**"Why do it the hard way?
Get an Actionrod!"**

You'll get more wallop with Actionrod's live action.

Here's the rugged steel rod that's delicately balanced, responsive to the touch. Years of experience in tapering and tempering steel give Actionrod a "custom-built" feel just as comfortable as your old fishing hat.

If you want quality you can *feel*—as well as *see*—it's Actionrod for you. Your favorite sports store has it.

ORCHARD INDUSTRIES, INCORPORATED
Detroit 5, Michigan

Complete
price
range



Wedge-Type
Reel Lock



Owner's Name
On Handle

ACTIONGLAS— Orchard's great new development in glass rods. Available in bait casting and fly rods. \$25 to \$35.

Actionrod

**"SOLID STEEL
WITH LIVE ACTION"**



1-minute angle set-ups!
Tilt it for the angle and lock it. You're set up for any operation, machine or bench. Two sizes, 2" and 2 3/4" jaws, with or without swivel base. Write for Vise

Folder and "Yankee" Tool Book.

YANKEE TOOLS NOW PART OF

STANLEY

Reg. U.S. Pat. Off.

THE TOOL BOX OF THE WORLD
NORTH BROS. MFG. CO.
Philadelphia 33, Pa.

HARGRAVE HAND SCREWS



Ideal for craftsmen in home shop or factory. Hargrave Hand Screws are strong and durable. Have refinements of construction found in no other Hand Screw. Spindles are cold-drawn with longer wearing "Acme" thread. Jaws are of selected maple. Openings in a complete range of sizes down to 2 inches.

At Hardware and Mill
Supply Dealers Everywhere.
Write for Catalog of
Complete line.
1955 Waverly Ave.
Cincinnati 12, Ohio



The CINCINNATI TOOL Co.

**Thompson
BEATS
the World
on BOATS**



**Better Built
Lower Prices**

**Safe Boats With
Full Length Spray Rails**
Keep passengers perfectly dry—even at high speeds. Catalog also shows two new models of "Take-Along" Boats. Two big factories—save you freight.

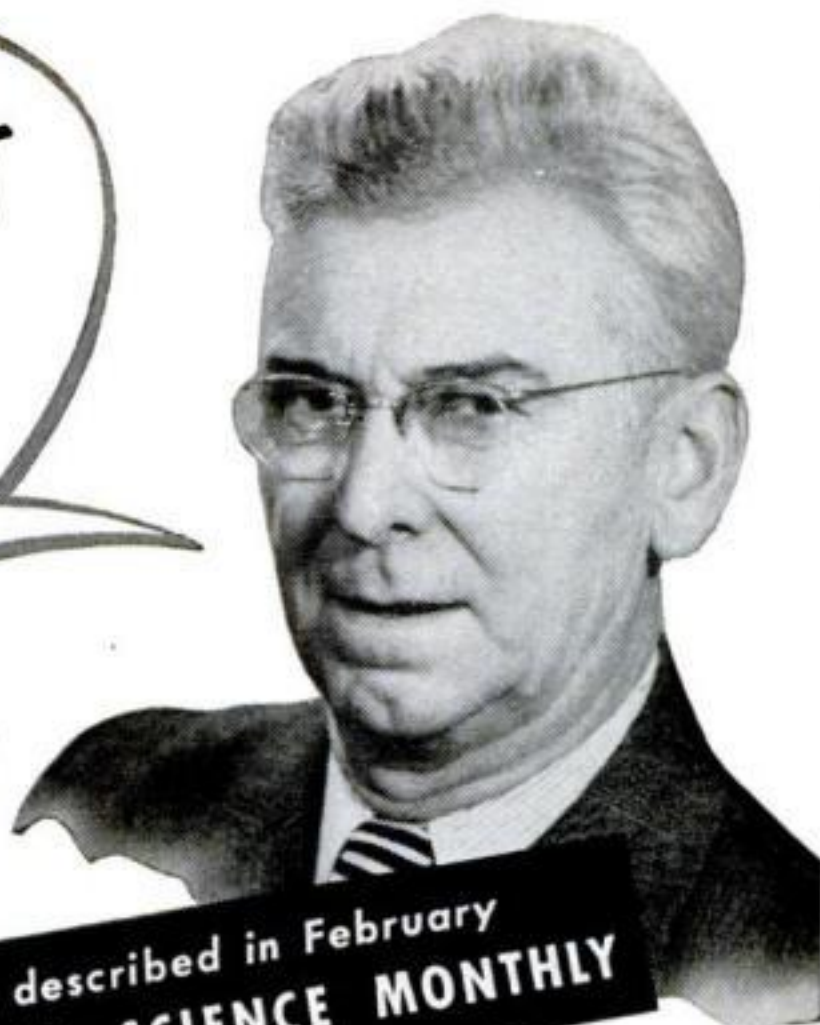
CATALOG FREE
Write for your copy. State kind of boat in which you are interested.
THOMPSON BROS. BOAT MFG. CO. (151)
219 Ann St.
PESHTIGO, WIS. (Write to either place)



Light Boat for Auto
**119 Elm St.
CORTLAND, N.Y.**

"HERE'S THE
BIGGEST IMPROVEMENT
IN DADO SAWING
IN 80 YEARS!"

EMMET J. WARREN, Inventor of
Warren Dado Sawing Washers



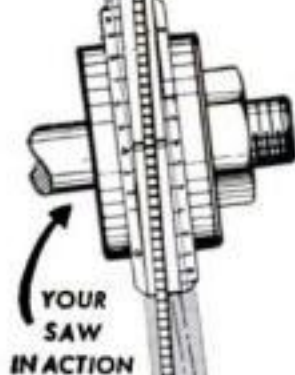
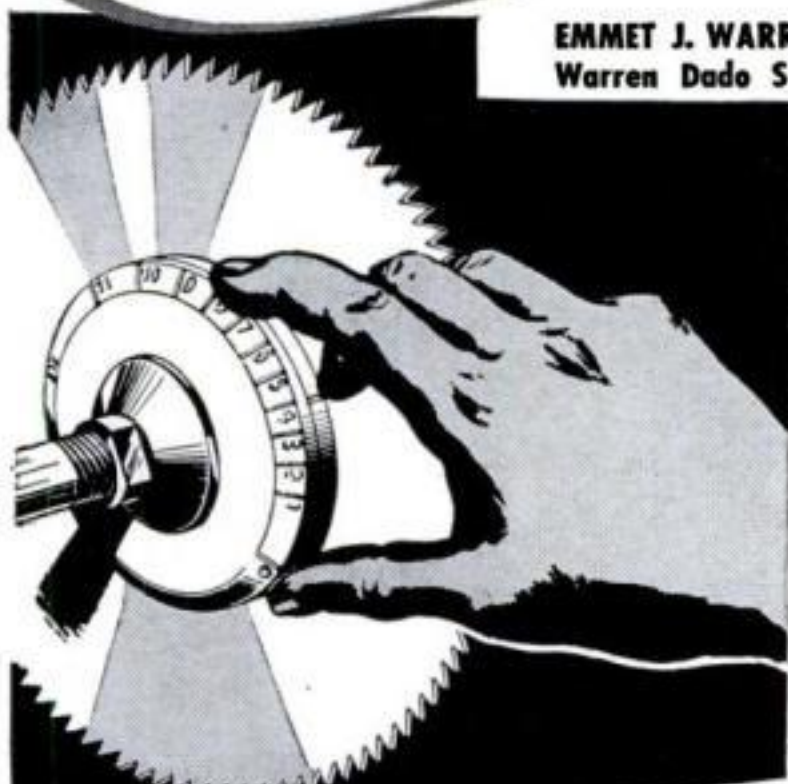
As described in February
POPULAR SCIENCE MONTHLY

Just dial YOUR SAW CUTS WITH MY AMAZING INVENTION

Yes, woodworkers, I too became impatient with clumsy, old-fashioned dado equipment. After years of research and experiments I have created my Warren Dado Sawing Washers. With these four scientifically engineered, simple washers and your saw blade you can make clean, accurate dados or grooves in 12 different widths at any angle! Think of it—no more chewing and burning cuts, no more sanding—just dial the width of cut you want with Micromatic adjustment and in 15 seconds you're making that cut—quick, clean and smooth! It's truly the woodworker's delight. My washers come in 5 sizes to fit any arbor— $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ", 1", $1\frac{1}{8}$ ". See your dealer today or use my handy coupon below. And remember, my ironclad guarantee of complete satisfaction or your money back, goes with every set of washers.

DEALERS, ORDER DIRECT!

NO MORE ROUGH
CHEWING...
BURNING-OUT CUTS
NOW MAKE IT
QUICK, CLEAN
AND ACCURATE!



YOUR
SAW
IN ACTION

\$4.95
SET

SEE DEMONSTRATIONS AT:

Penn. Hardware Show
Cleveland Home Show
Cleveland Sportsmen's Show
Minneapolis Sport Show

Warren

DADO SAWING WASHERS

WARREN WASHERS COMPANY, DEPT. 43
70 Medbury, Detroit 2, Mich.

Enclosed \$4.95 for one set of Warren Washers, postpaid.

My arbor size _____

NAME _____

ADDRESS _____

CITY _____ STATE _____

you see it—with a

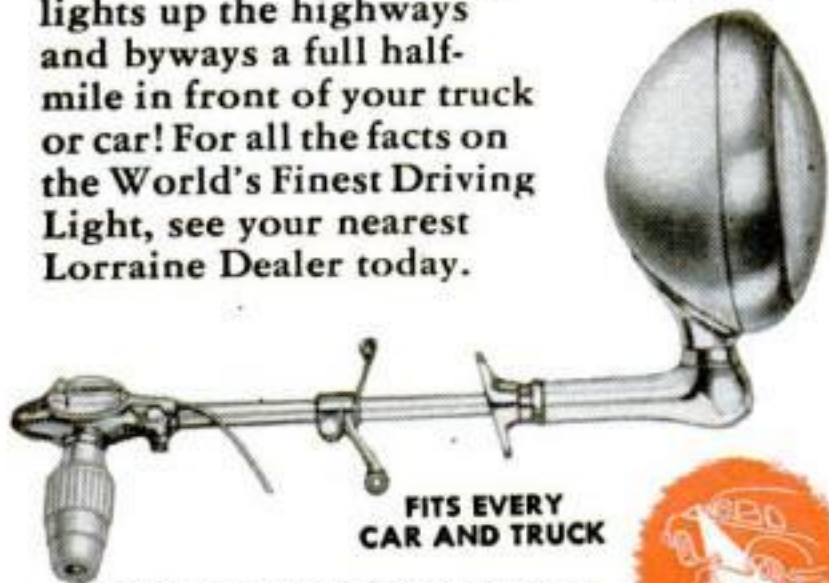
LORRAINE



Nighttime Utility ... Daytime Style

Danger ahead! But you've got a Lorraine and you've spotted the trouble in plenty of time. No screeching stop, no jarring crash—because the sealed beam spotlight unit in your Lorraine Driving Light casts a *glareless* ray four times more powerful than an auto headlight.

A Lorraine takes the strain from night driving, lights up the highways and byways a full half-mile in front of your truck or car! For all the facts on the World's Finest Driving Light, see your nearest Lorraine Dealer today.



FITS EVERY
CAR AND TRUCK

APPLETON ELECTRIC COMPANY
1746 Wellington Ave., Chicago 13, Ill.
Manufacturers of Lorraine and
Appleton Driving Lights
Industrial Lighting Equipment, Conduit Fittings, Reelites



STREET SIGNS



HOUSE
NUMBERS



UTILITY



SAFETY



THE WORLD'S FINEST driving light

FINE TOOLS NEED FINE OIL!



• Lubricates

• Prevents Rust

• Cleans • Polishes

SOLD EVERYWHERE

3-IN-ONE Oil

FASTEST PLANER in the WORLD at this Low Price... \$215⁰⁰

BELSAW Multi-Duty Planer

Speed up production! Increase your profits! BELSAW power self-feeds at 24 feet per minute... The lowest-priced surfacer that will handle 12 x 6 in. stock. Planes green or dry sawed lumber into smooth, worked forms. Three high-speed steel knives make 42 cuts per inch. Multi-duty BELSAW takes inexpensive attachments for all planing mill operations—Jointing, Rabbeting, Grooving, Matching. BELSAW is the *only* 12 in. planer providing *attachments for jointing and grinding its own knives*. Start planning NOW for BIGGER VALUE and BETTER PERFORMANCE, with BELSAW. Write for FREE specifications, illustrations and low prices.



• LARGER CAPACITY • FASTER
OUTPUT • KNIFE SHARPENING
ATTACHMENT

BELSAW MACHINERY CO B1024 Field Bldg., 315 Westport Rd., Kansas City, Mo.

BUILD YOUR OWN ZEOLITE WATER SOFTENER



You can do it inexpensively with only a wrench and a little spare time. Famous Zeolite process softens water and removes all iron. Send \$1 for easy-to-follow directions and list of materials. (Materials available locally or from us.) Or inquire about factory-built LARCO Softeners \$45.75 up. LAKE REGION MFG. CO., INC., 3920-B Lynn Ave., Minneapolis 16, Minn.



Pat. applied for

J. C. MOORE INDUSTRIES P.O. Drawer 276
FREDONIA, PA.

**Start a NEW BUSINESS
Or Add to Your Present
Repair Business**
Sharpen Dull Pipe Wrenches
Pipe Taps & Dies
"Gum" Circular Saws
Write for information.

BUILD HEAVY DUTY MACHINES

SAVE UP TO 90% You can build, using our practical, easy-to-read plans, all kinds of machines, for home, farm or shop—scooters, portable sawmills, metal working machines, concrete machinery of all kinds, printing equipment, woodworking machines, midget autos, dish washers, farm equipment, freezers, tractors.

FREE

CATALOG HANDBOOK
183 SETS OF PLANS
VALUABLE INFORMATION

NICHOLS EQUIPMENT COMPANY
Dept. D-2104
PURVIS, MISS.

"Wellworth" Sensational Offer! WESTINGHOUSE AIR COMPRESSOR

plus pressure tank, safety valve,
gauge for tank, air regulator &
gauge, filter, spray gun, 20 ft.
air hose, check valve & air chuck

11 ITEMS \$42⁷⁵
ALL For

IDEAL FOR HOME • FARM • FACTORY

Wherever compressed air is needed

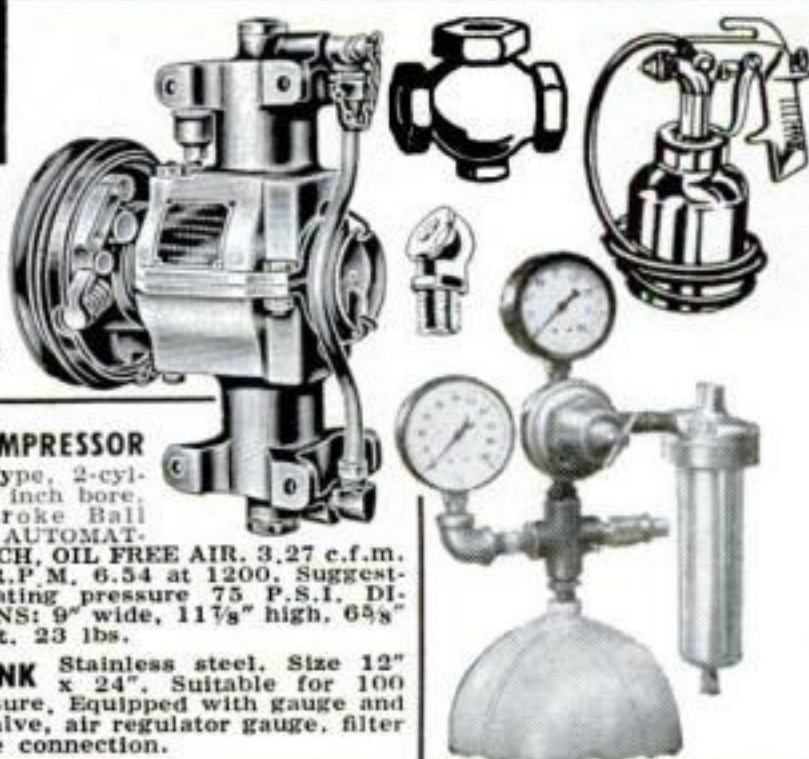
A fortunate purchase from the government enables us to offer you this amazing buy at a small fraction of its original cost. All brand new. You get the WESTINGHOUSE COMPRESSOR and all of the accessories shown for Only \$42.75. Shipping wt. 40 lbs. Designed for automotive truck or tractor mounting. Can be run off fan belt or power takeoff, or mounted horizontally. Comes with automatic clutch. Can be installed for use on farm trucks, jeeps, tractors, tire or garage service trucks, contractor or road building machinery, pneumatic devices, etc. Can be operated with 1/2 H.P. or more electric motor or equivalent portable gas engine.

Compressor separately, \$22.50

THE COMPRESSOR

Piston Type, 2-cyl-
inder, 2 inch bore,
1 1/2" Stroke Ball
Bearing, AUTOMAT-
IC CLUTCH, OIL FREE AIR, 3.27 c.f.m.
at 600 R.P.M., 6.54 at 1200. Suggest-
ed operating pressure 75 P.S.I. DI-
MENSIONS: 9" wide, 11 1/8" high, 6 3/8"
deep, Wt. 23 lbs.

AIR TANK Stainless steel, Size 12"
x 24". Suitable for 100
lb. pressure. Equipped with gauge and
safety valve, air regulator gauge, filter
and hose connection.



AMAZING "Wellworth" COMPRESSOR DEAL



• Compressor only—
\$17.95 • Spray Gun
and Hose—\$10.45—
Wt. 5 lbs. • Tank and
accessories as shown above—\$14.50. Wt.
7 lbs. • Adjustable 1/4" Pop Valve—
\$1.50 • 2 1/2" Air Gauge—\$1.75.

AIR COMPRESSOR: Piston type, size 2 x 1 3/4", both valves
in head, bronze bearings, splash lubri-
cation, "V" Belt drive. Intake muffler and cleaner. Capacity
2.8 c.f.m. at 100 lbs. continuous pressure or 150 lbs. inter-
mittent, with 1/2 HP motor. Can be used with 1/4 HP or 1/3 HP
at lower speed. Wt. 14 lbs. Operating instructions furnished.

AIR TANK: Stainless steel, 6" x 24" with gauge and safety
valve, air regulator gauge and filter, drain cock,
hose connection. Suitable for 100 lb. pressure.

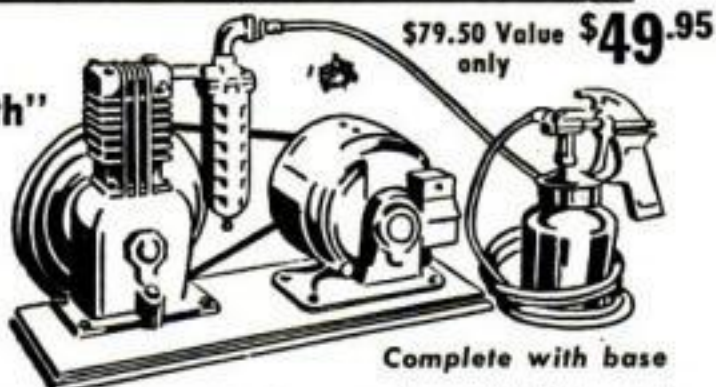
SENSATIONAL OFFER!

Complete outfit consists of compressor, pressure spray
gun with 2 nozzles, pop valve, airchuck, 20 ft. hose,
air tank and accessories as described. Complete for
only

\$37⁵⁰

PORTABLE SPRAY OUTFIT

1/3 HP
"Wellworth"
ELECTRIC
MOTOR
DRIVEN
OUTFIT



Complete with base

\$79.50 Value \$49.95
only

Well balanced portable outfit for use where paint job requires
larger quantity of material. Sprays all types of average viscosity
paints, enamels, lacquers, varnishes, etc. Piston type, single cyl-
inder air compressor, 2 in. bore by 1 3/4 in. stroke. Displacement
2.86 c.f.m.; maximum working pressure 40 lbs. Mounted on
sturdy wood base with rubber feet. Pulsation cham-
ber equipped with safety valve, drain cock, 1/3 H.P.
G-E motor, 110-volt AC, cord and plug; 20 ft. air
hose and fittings. Spray gun is pressure feed type,
internal atomizing, with one qt. metal cup. Fan and
round spray nozzle furnished. Shipping wt. 50 lbs.

Price only
\$49⁹⁵

"Wellworth" COMPRESSORS

Build your own compressor unit. Sizes 12,
17.3, 30 and 45.7 c.f.m. at 100 lbs. per sq.
inch. Timken bearings, splash lubrication,
automatic unloading and idling.

Built-in loadless starting for automatic
stop and start operation, or constant speed
suction unloader for continuous operation.
Single stage duplex cylinder with intake
filter. 1 Year Guarantee.

State if desired for automatic stop and start
or continuous operation with constant speed
unloader. Belts, pulleys, motors and gasoline
engines available. Prices upon request.



PNEUMATIC AIR TOOLS

Riveting and chipping hammers for many uses: riveting, chipping,
hammering, auto body work, concrete breaking, etc.; used, guar-
anteed like new.

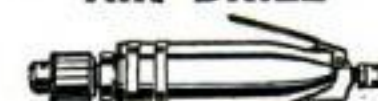
Chicago Pneumatic Riveter & Chipping Hammer



CP4X Pistol grip
handle with air
control. Takes up
to 3/16" rivet.
Weight 6 lbs. List
price \$73.00.

Special \$12⁹⁵
Price as above, \$19⁵⁰
brand new...
Size CP3—Takes \$8⁹⁵
5/32" Rivet.

Chicago Pneumatic Lever Type AIR DRILL



With 1/4" Jacob Chuck. Wt. 2
lbs. List price \$55.00. \$15⁰⁰
Only.

A.V.C. 11 INGERSOLL RAND



Push button, takes 5/32" rivet.
Wt. 3 lbs. List price \$8⁹⁵
\$65.00. Only.



**Automatic Pressure
Switch with Unloader**
Double pole, with 2 way
release valve. Set at
125 to 150 lbs. pres-
sure. For use on com-
pressor units 1/4 to 3
H.P. Pressure range 20
to 200 lbs.
Weight 4 lbs. ONLY \$10.25

Automatic Water Pressure SWITCH

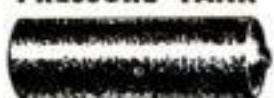
Double-Pole, double
break. Range 5 to
60 lbs. Set 20 to
40 lbs. Wt. 2 lbs.
Special \$5.50
at

"WELLWORTH" CHECK VALVES



1/4" valve \$ 2.75
1/2" valve \$ 4.50
3/4" valve \$ 9.50
1" valve \$12.50

"WELLWORTH" PRESSURE TANK



8" x 42" Welded Steel.
3/4" opening on each end.
1/4" and 3/8" openings at
centers. Convex Head and
Bottom. 100 lbs. working
pressure. Shipping Wt. 35
lbs. SPECIAL PRICE only
\$8.75

POP TYPE VALVES

Has a close range
of closing after
pop-off
pressure
is reach-
ed. 1/4"
pipe
thread.
Only \$1.50



Ingersoll Rand AIR DRILL



With 1/4" Jacob
Chuck. Wt. 2 lbs.
List price
\$55.00. \$15⁰⁰
Only.

A.V.C. 10 INGERSOLL RAND CHIPPING HAMMER



Takes 1/4"
rivet. Wt.
3 lbs. List
price \$80.00. \$8⁹⁵
Only.

6 Ft. Stow Flexible Shaft



3/8" Core. Ball bearing han-
dle and arbor. Operates on
1/4 H.P. Motor at 1725 or
3450 r.p.m. \$29.00 value,
\$14.50. Wt. 8 lbs.

Price f.o.b. Chicago. Immediate delivery. All items sold on money back guarantee. Send check or money order today. Write for free folder.

WELLWORTH TRADING CO.

Merged with
C & M Equipment Co.

1831 S. STATE ST., DEPT. B-3
CHICAGO 16, ILL.



The easy way to paint!

Speedy Sprayer

Favorite of home owners and craftsmen for 20 years! SPEEDY SPRAYER gives your work that professional paint finish everyone admires. Sprays paint, enamel, varnish, lacquer, etc. . . . 4 to 7 times faster than hand brushing! Lightweight, portable, uses any 1/4 H.P. motor. Improved diaphragm principle assures clean, oil-free air. You'll find dozens of time and money saving uses for SPEEDY SPRAYER, including spraying insecticides 2-4-D and DDT. Complete outfit, without motor, only \$26.95.

ONLY
\$26⁹⁵
LESS
MOTOR

At leading hardware, lumber, and auto supply dealers.
FREE—write for handy booklet "How to Spray."

W. R. BROWN CORPORATION

5718 Armitage Ave. • Chicago 39, Ill.

WRITE NOW FOR FREE CATALOG NO. SM

THE foster LINE
POWER TOOLS

FOSTER MFG. CO., 247 DELAWARE AVE., BUFFALO 2, N. Y.

now YOU CAN DRILL YOUR OWN WELLS!

Sturdily Made—Hundreds of satisfied customers. Purchased and used by U. S. Dept. of Agriculture, U. S. Dept. of Forestry, U. S. Navy and many foreign countries. Fully Guaranteed. Price Complete, \$385.00; Less Motor, F.O.B. Factory. Price includes drill, bailer and 100' cable, 200 ft. of additional length available at extra cost.

Drill your own wells for that needed water—as many as you need—outside—in the cellar—in the barn. The new improved CONSOL Driller—1949 Model—is equipped with a special replaceable Drill Head. It will drill through many feet of solid rock without resharpening. Simple to operate, easy to set up. Do the work yourself at small cost.

A HEAVY DUTY MODEL for 6" casings also available at \$1295., F.O.B. Factory, equipped with Gasoline Engine.

Write for free information and booklet, Dept. PS.

CONSOLIDATED INDUSTRIES
West Cheshire, Conn.



NEW KNIFE SENSATION!

A MUST for every
Model Builder,
Hobbyist,
Tinkerer!



Amazing ideal! Amazing value! Imagine—a knife that looks just like an expensive fountain pen. Handy, convenient to carry in pocket or purse. Ideal for model builders, amateur radio men, home workshops. No tool box should be without one. Pen-like housing contains super-sharp carbon steel blade that slips in and out of safety holder with flick of finger. Adjusts to any length up to 13 1/2". Weighs less than one ounce. Handsomely, sturdily made of durable spun aluminum and red plastic. **ORDER TODAY!** Just send name and address. Pay postman \$1.00 plus postage on delivery. Send \$1.00 with order and we ship postpaid. You must be delighted or your money back. Order several—they make ideal gifts for men, women, boys—everyone!

HALL PENROD
Dept. 120 222 W. North Bank Dr. Chicago 54, Illinois

Learn to **MOUNT BIRDS**

Tan SKINS, make up FURS

Be a Taxidermist. Double your hunting fun. We teach you at Home. Mount Birds, Animals, Fish, Heads, common specimens. Fun and profits. Decorate home and den **MAKE MONEY**. Mount game, tan for others. Big profits in spare time. **WRITE TODAY.**

FREE BOOK 100 game pictures in **FREE BOOK** Hunters, get your copy. It's Now Free. Send post card. State your AGE. **NORTHWESTERN SCHOOL OF TAXIDERMY** Dept. 2663 Omaha, Nebraska

RADIO ENGINEERING

Television, FM, Broadcasting, Servicing, Electronics, Aviation, Marine & Police Radio taught thoroughly. 72 weeks' Engineering course equivalent to 3 years' college radio work. Approved Veteran Training. Catalog upon request.

VALPARAISO TECHNICAL INSTITUTE
Dept. 503 Valparaiso, Ind.

EASY TO LEARN CODE

Learn or increase speed with an Instructograph—the Code Teacher that takes the place of an operator-instructor and enables anyone to master code without further assistance. Available tapes from beginners alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready—no QRM. Thousands have "acquired the code" with the Instructograph System. Write today for convenient rental and purchase plans.

INSTRUCTOGRAPH COMPANY
4701-P Sheridan Road, Chicago 40, Illinois



REBUILT MOTORS FOR CARS & TRUCKS

You Can Save A Lot of Money at Our Low Prices. Also **AUTO PARTS & ACCESSORIES**
Write for Our Low Prices. Prompt Attention.

J. C. WHITNEY & CO.

1919 ARCHER AVE. CHICAGO 16, ILL.

Bar Bells
Buy Direct From Factory
Write for free booklet and price list
\$8⁹⁵ up
INDEPENDENT IRON WORKS
2416 East 23rd Street, Dept. C
Los Angeles 11, Calif.



BINOCULARS, 6 x 30 Universal, used, good condition, with case..... **\$42.50**
BINOCULARS, U. S. Navy 7 x 50 used, good cond. with case..... **\$95.00**
BINOCULAR CASES, 6 x 30, two grades, leather, new..... **\$5.00 & \$7.50**
 7 x 50 Leather Binocular Case, new..... **\$7.50**
TELESCOPES, U. S. Navy, 16 power with case, Val. \$125..... **\$29.50**
 5 Power Ranger **TELESCOPES**..... **\$2.00**
 Engineers Metal Army Type **SIGHTING LEVELS**, new..... **\$2.00**
SURPLUS GOVT. TRIPODS for Level, Transit, Cameras, etc. Used, Good Condition. **\$5.95**
NEW TRIPODS for Transits, Levels, etc. Value \$75.00. Special..... **\$13.50**
TRANSFORMERS, Western Elec. 5 volt to 650. **\$4.95** New.....
CANVAS SAFETY BELTS, Metal Snaps, New, \$3.00 Val..... **75c**
 Many unadvertised specials. What do you Need?
 4th Edition Annual Gun Digest \$1.50

Public Sport Shops

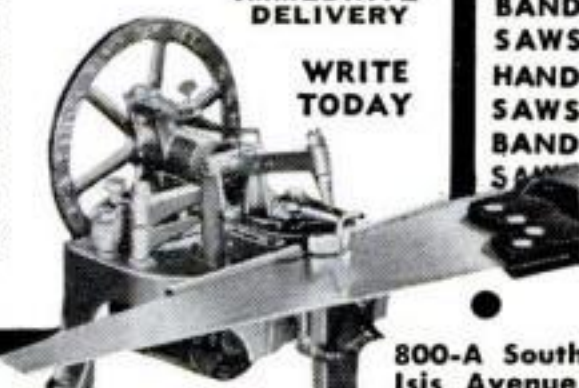
11 S. 16th St., Phila. 2, Pa. No COD'S

EXTRA PROFITS FOR SAW SHOPS WITH BeMaCo RAPID SAW SET

IT'S AUTOMATIC
 Sets hand saw teeth in 60 seconds—Approx. 400 band saw teeth. 4½ to 12 points with one adjustment. Hammer and anvil action does precision job. Every tooth alike—no breakage.

IMMEDIATE DELIVERY

WRITE TODAY



BEAVER MFG. CO.

800-A South Isis Avenue, Inglewood, California

WINDOW SIGN LETTERS GENUINE GOLD LEAF

Guaranteed not to tarnish or fade. For store fronts & office windows. Anyone can put them on. These letters are made of tinfoil, and applied with a varnish cement.

SAMPLES FREE

METALLIC LETTER COMPANY, 428 N. Clark St., Chicago

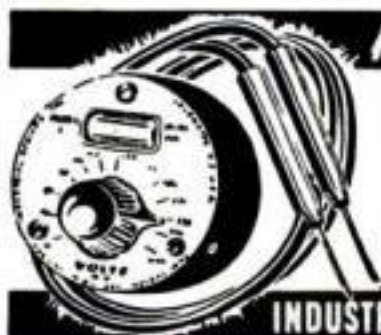
GENUINE DIAMOND SCRIBER!

Writes on glass, metals, plastics, Hex. Aluminum 6". Money back. No C.O.D.'s; send cash, M.O., or check.

\$2.00 Postpaid

CLIPPER DIAMOND TOOL CO., INC. 21-A W. 46 St., N.Y. 19

FLASH THAT VOLTAGE



Turn that knob. Extinguish the neon glow. Instantly read voltage right off dial. MINI-VOLT measures 65 to 660 v. AC. Also DC. Tells whether AC or DC. Virtually burnout-proof. Lamp guaranteed 10,000 hours. Plastic case. 12" flexible test leads and test prods. A "must" in electrical and radio work. At your dealer's or postpaid 2.75. (C.O.D. 25c extra)

INDUSTRIAL DEVICES, INC., EDGEWATER 2, N.J.

THIS IS THE OUTBOARD MOTOR YOU'VE BEEN WAITING FOR



- Gear shift Control
- Calibrated Carburetor
- Ful-Vue Fuel Gauge
- Twin-Grip Hand-Holds
- Idle-Minder
- Synchro-Control
- Salt Water Protection
- Separate, Mile-Master Fuel Tank
- Vari-Volume Pump
- Lubri-Tite Seals
- Rubber-floated Propeller
- Perfected Alternate Firing Twin
- Flex-Mount Power Head
- 40 Great Features!



FREE HANDY CHART

Write for new 1949 Sea-Horse Handy Chart. Illustrates, charts the QD and the 4 other great Johnsons for '49. All features fully described. Write today. JOHNSON MOTORS, 500 Pershing Road, Waukegan, Ill. Johnson Motors of Canada, Peterboro, Canada

JOHNSON SEA-HORSES for DEPENDability

- MODEL HD—Small Alternate Firing Twin 2.5 H.P.*
- MODEL TD—Medium Alternate Firing Twin 5.0 H.P.*
- MODEL QD—Large Alternate Firing Twin with Gear-shift Control and Mile-Master Fuel Tank . 10.0 H.P.*
- MODEL SD—Super Alternate Firing Twin with Mile-Master Fuel Tank 16.0 H.P.*
- MODEL PO—Heavy Duty Opposed Twin 22.0 H.P.*



* All ratings are OBC Certified Brake H.P. at 4000 r.p.m.



-or double-your-money-back!

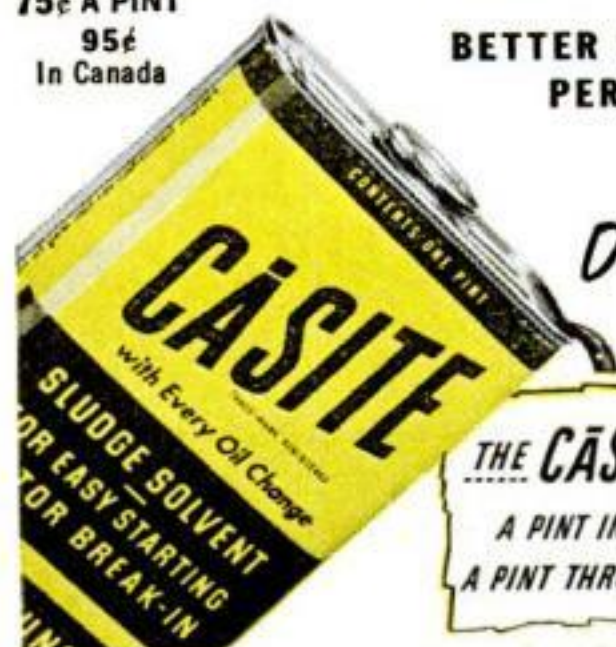
You'll feel the difference in your car the first time you drive—after a Casite treatment. You'll have new, snappy pick-up, more power, smooth going.

Casite treatment is simple, quick, sure. Casite gets rid of winter's sludge, gum and goo . . . cleans your engine . . . leaves it free and lively. Casite gives extra protection by improving lubrication, thus cutting repair bills. No matter what kind of motor oil used, Casite gets it around quickly and into the tight spots.

Get a Casite treatment today—from your garage, service station, car or implement dealer.

THE CASITE CORP. • HASTINGS, MICHIGAN
Casite Division, Hastings Ltd., Toronto

75¢ A PINT
95¢
In Canada



**BETTER AND SMOOTHER
PERFORMANCE
OR**

*Double-Your
Money Back*

THE CASITE TREATMENT
A PINT IN THE CRANKCASE
A PINT THROUGH THE AIR INTAKE

100 Fireplace Ideas FREE

For Home, Playroom, Cottage, or Camp



**If You're Building Your Own Fireplace
HERE'S AN EASIER FOOL-PROOF WAY TO DO IT**

Choose a design that will look well with the materials you have available. Prepare a concrete or brick slab the size of your fireplace. Center your FYRO-PLACE, the warm-air circulating form, on the base, and build round it. You will have a well-engineered, successful fireplace. You can't fail.

WRITE FOR BOOK TODAY
Small Book 4 1/4 x 5 1/2 sent free. Larger Book, 8 1/2 x 11, beautifully illustrated, 25c
Ask for Free Data on Outdoor Fireplaces



PRICE FIREPLACE HEATER & TANK CORP.
175 Austin Street, Buffalo 7, New York

BIG FOUR PISTOL GRIP SUPER POWER SCREW DRIVER



Heat treated steel clutch fits all Phillips, Yankee and other standard bits sold by hardware and supply dealers. Automatic reverse turn without removing bit from slot. Indispensable for woodworking and machine shops, auto body and cabinet work, hobby shop and home use. We ship, postpaid, with one bit, for **\$2.25**.

Big Four Junior has single bit, not removable. Otherwise same as above, **\$1.25**. Money-back guarantee. Send your order today.

BIG FOUR INDUSTRIES 39 Carthage Avenue
CINCINNATI 13, OHIO

BUILD YOUR OWN GOVERNOR



Complete Plans and
Specifications
ONLY \$1.00

From Discarded Automobile Parts!

Assemble it yourself—Save 65%. Precision speed control. Use any car or truck engine for efficient power source. Write to:

ADVANCE ENGINEERING CO.
P. O. Box 723, Milwaukee 1, Wis.

make your own Gems **29.50**
F.O.B.

All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only \$29.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B&I MANUFACTURING CO.
Dept. M Burlington, Wis.

WOOD CARVING

9" TALL FIGURINE Postpaid
in U.S.A. **\$1.85**

This beauty is easily carved in white pine with a mahogany and velvet base. Complete kit includes Material, Tru-Form templates and instructions. For more new and unusual projects send 10c for latest catalog.

BRAUN-CRAFT 1232 ETOWAH, DEPT. PS-15
ROYAL OAK, MICHIGAN

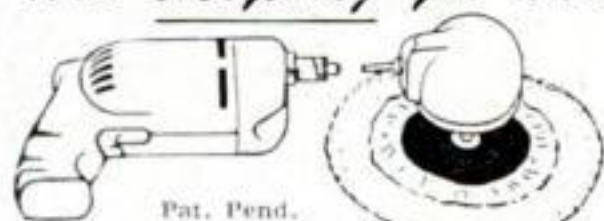


SANDING

The only attachment for angle-head electric drilling.

POLISHING

Why Pay More and Get Less? Only the BULL BUFFER
Has everything you want in a polisher-sander!



Pat. Pend.

You polish and sand faster, easier—do beautiful, professional work—with this amazing attachment for your electric drill. (You can also drill up to $\frac{1}{2}$ " with your $\frac{1}{4}$ " drill and at right angles never before possible!) Bull Buffer more than pays for itself the very first time you make your car, floors, woodwork, furniture gleam like new. It's built of lifetime materials and guaranteed. Thousands and thousands of satisfied users. At your dealer or send cash, check or money order for your **\$9.95** Bull Buffer, complete as pictured. Only.

1. Fits any chuck on an electric drill or flexible shaft—no extra power unit to buy!
2. Only Bull Buffer has gear reduction—the power to do any job without injury to your electric drill!
3. Only Bull Buffer has swivel action—turns in complete circle when drill is stationary!
4. Only Bull Buffer has angle head for electric drill—gets to all hard-to-reach surfaces, curved or flat!
5. Only Bull Buffer has 3 speeds*—"same as," $\frac{1}{2}$ -speed, or twice speed of your drill!

*See description under photo of Bull Buffer kit.

BERTRUM L. ENGINEERING CO.
3121 Main St. Dealers Write for Name of Nearest Wholesaler Kansas City, Mo.



Bull Buffer comes complete with sheepskin bonnet and two sanding discs, only \$9.95. Bull Buffer alone cuts drill speed $\frac{1}{2}$; for direct drive (or same as) drill speed, order Adapter A with Bull Buffer; for twice drill speed, order Adapter B.

ORDER THESE ACCESSORIES FOR YOUR BULL BUFFER

$\frac{1}{2}$ " Jacobs No. 6425 key chuck; with the Bull Buffer, increases $\frac{1}{4}$ " drill to $\frac{1}{2}$ " capacity—reduces speed, increases power **\$5.00**
Extra sanding discs (000-00-0-1-21-3-4) each **10c**
21" cup wire brush for removing paint, rust, scale, etc. **\$1.75**
Extra sheepskin bonnet **\$1.25**
Adapter A—for direct drive at "same as" drill speed **\$1.00**
Adapter B Set—for sanding at twice drill speed **\$2.00**
Bull Buffer car cleaner **50c**
Bull Buffer car polish **\$1.00**

Increase the CROP CAPACITY
of Your Land with a
SEAMAN ROTARY TILLER



MAKES BETTER SEEDBEDS...

- Thoroughly "mixes-in" Cover and Fertilizer to provide better plant food balance.
- Breaks Up Clods. Tills soil fine, medium or coarse to fit your need.
- Conserves moisture, aerates soil, helps to control weeds and crop pests, hastens seed germination, helps get rid of plant-starving air pockets.

The power-driven tines of the Seaman Rotary Tiller dig up the ground, break up clods and mix trash, cover crop, manure or other fertilizer evenly throughout the seedbed. This actually increases the crop capacity of the land because there is a better chance for effective decomposition of the plant-food elements . . . in quantities and places that will do the growing crop the most good for the longest time.

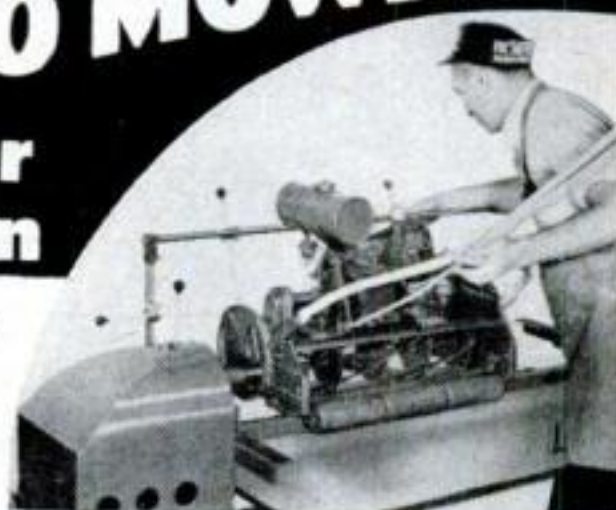
Write for Bulletin NST, describing and illustrating all models . . . both motorized and power take-off, 3 to 7 ft. tillage widths.

SEAMAN MOTORS, INC. 365 No. 25th Street, Milwaukee 3, Wis.

Sharpens
1,000 MOWERS
per Season

in spare time
with the

FOLEY
LAWN MOWER SHARPENER



"I have sharpened over 10,000 mowers in my Foley Lawn Mower Sharpener in the last 10 years—only repairs needed were new belts"—C.H.S., Calif. From R. R., Ill.—"The first month's business paid for my machine." The Foley sharpens all sizes and types of mowers in 15 or 20 minutes (with handles on). Prices run from \$1.50 to \$2.00 for hand mowers, and \$5.00 to \$8.00 for power mowers. This is the way to make money!

Low Prices, Less than \$50 Starts You

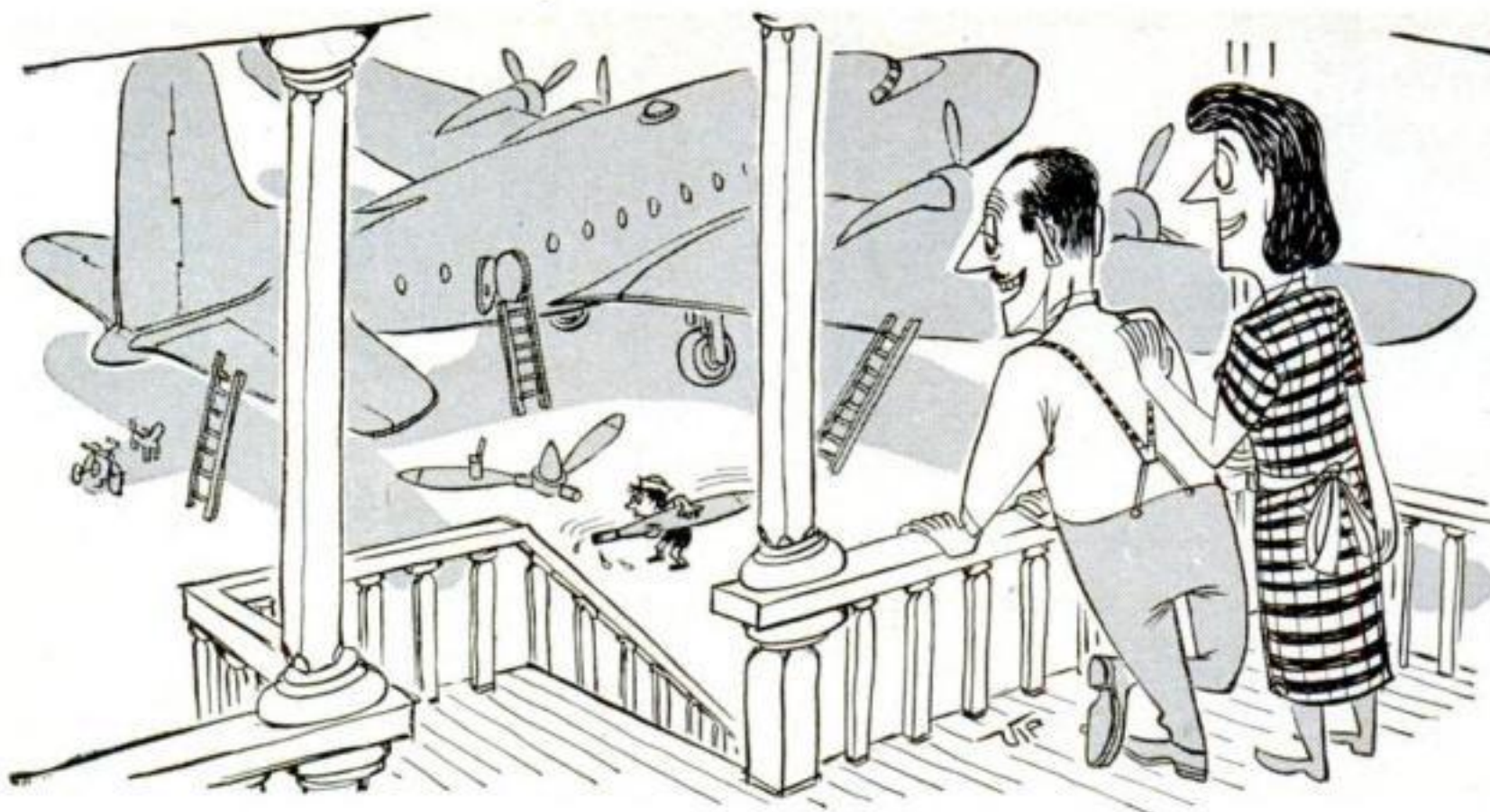
Start your business on payment plan if you wish—less than \$50 will put a new 1949 model Foley Lawn Mower Sharpener in your hands ready to go, 99c out of each dollar you take in is profit, FREE PLAN shows how to start—mail coupon today!



Send for FREE PLAN

FOLEY MFG. CO., 308-9 Foley Bldg., Minneapolis 18, Minn.
Send FREE PLAN on the Foley Lawn Mower Sharpening business.

Name.....
Address.....



"And to think how we laughed when Junior asked for a can of Weldwood Glue to build a model plane"

When you want a wood-to-wood bond that will really hold... remember Weldwood Glue. It's quick to mix... easy to use... tremendously strong... stain-free... rot-proof... and permanent. At hardware stores, lumber yards, chain stores, in 15¢, 35¢, 65¢, 95¢ and larger sizes.



WELDWOOD
PLASTIC RESIN GLUE

United States Plywood Corporation, New York 18, N. Y.



BINOCULARS

7x50 MILITARY

Indiv. Foc.\$44
with Coated Optics \$54

6x30 German
Cent. Foc. 13 oz. \$37.50

8x32 Brownscope
Cent. Foc. Coated. \$39.50
Fine Cases Included

7x50
\$44

Ht. 7 in.
Wt. 37 oz.

Add U.S. Fed. Tax

WE PAY THE POSTAGE — MONEY BACK GUARANTEE
BROWNSCOPE CO. Dept. 3P, 24 West 45th St.
New York 19, N. Y.

LOCKSMITHING & Key Making

PRACTICAL UP-TO-DATE COURSE



Easy-to-learn modern information for self-instruction. How to work on locks, pick locks, de-code, make master-keys, repair, install, service, etc. For every handyman, home owner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith. 53 plain illustrated lessons. Full price only \$3.95. SEND NO MONEY. Just postman plus C.O.D. postage. Or send \$3.95 with order, we'll postpaid. Satisfaction guaranteed or refund. Address below.



WATCH & CLOCK REPAIRING

Learn at Home in Your Spare Time!... Prepare for a happy future, with security—and qualify for a good job NOW. A fascinating and thorough self-instruction training in American and Swiss watches and clocks. Special section on alarm clock repairs. Fast-growing field. Satisfaction is guaranteed. Full price only \$4.95, postpaid—or COD plus postage.

Nelson-Hall Co., 1139 S. Wabash Ave., Dept. C-1, Chicago 5, Ill.

*The New Improved
All-Purpose*

DYNAMIC Super Charged ARC WELDER

Industrial Transformer Type

IDEAL FOR AUTO HOME APPLIANCE AND FARM IMPLEMENT REPAIRS

WORKS on IRON, STEEL and other metals. Does work you'd expect from a larger costlier machine. Portable, easily carried. OPERATES from any properly wired 110 Volt Line. Also available for 220 volt current at slight additional cost.

IT WELDS • IT BRAZES • IT SOLDERS

EASY TO OPERATE TRANSFORMER TYPE WELDER. If inexperienced you can learn to do professional work by following the SIMPLIFIED WELDING and OPERATING INSTRUCTIONS FURNISHED—comes complete ready to operate with helmet, rods, cable, instructions. SAVE TIME and MONEY—Do your own welding. Just a few repair jobs will pay for this machine. A practical and profitable machine tool for any workshop. Make money doing repair work for others. Write today for full particulars.

DYNAMIC WELDER CO., Dept. 39-AT, 15 E. 23rd St., Chicago 16, Ill.

SPECIAL GIFT OFFER! ARC TORCH WORTH \$6.80 YOURS at NO EXTRA COST!

TWIN CARBON TORCH (illustrated) for use with DYNAMIC is unsurpassed for brazing, soldering, pre-heating and cutting iron, steel, brass, bronze and other metals. With it you greatly increase profitable uses of your welder. Does work of oxy-acetylene torch. Comes complete with instructions, carbons and cables. For LIMITED TIME ONLY we are giving a

Twin Carbon Electric Arc Torch worth \$6.80 with every DYNAMIC WELDER. Act now to get this valuable premium at the single low price of welder alone.



ONLY
\$28.50
COMPLETE



—Mail Coupon FOR FREE FACTS—

10-DAY TRIAL OFFER

DYNAMIC WELDER CO., Dept. 39-AT, 15 E. 23rd St., Chicago 16, Ill.

Send me FREE details of your ELECTRIC Arc Torch Gift Offer and Dynamic Welder 10-Day TRIAL OFFER.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

**SAVE TIME
AND WORK!**

**MAKE EXTRA
MONEY!**



**EASY TO
OPERATE**

**SHAW
DU-ALL**

**and "PEPPY PAL"
GARDEN TRACTORS**

PLOW



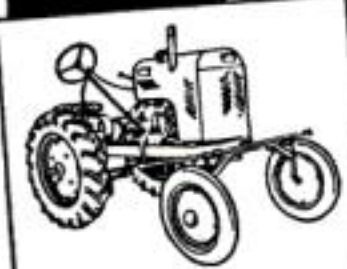
HARROW



CULTIVATE



MOW



RIDE

These sturdy walking and riding tractors ideal for dozens of uses around the farm, orchard, garden, golf course, estate and poultry farm.

DO DOZENS OF JOBS

Shaw Du-All or Peppy-Pal tractors do many jobs quickly and easily. Plow, cultivate, harrow, mow, disk, bulldoze, spray, grind, haul and saw wood. New uses discovered every day.

BUILT FOR RUGGED WORK
Sturdy, extra-strength construction means low upkeep, long life. Patented tool control allows quick shift for crooked rows. Attachments easy to change with new "Jiffy Hitch."

CHEAP TO OPERATE

Operates on few cents an hour. Soon pays for itself in time and labor-saving plus low initial and operating costs.

LOW FACTORY PRICES

Buy direct or through your dealer! Almost anyone who has a garden can afford a Shaw Du-All or Peppy-Pal. Full year's guarantee.

RIDING TRACTORS

Four models, from 5 to 12½ H.P., 58 in. wheelbase, 36 in. wide, 24 in. plant clearance. Hand or electric starter. Improved steering device, brakes enclosed in differential housing shaft. Standard hitch for trailers and wagons. Plow, harrow, cultivator, cutter bar, snow plow, bulldozer available.

PROMPT SHIPMENT

No waiting—order now for immediate delivery.

FREE: Illustrated folders giving complete details and price lists. Write today.

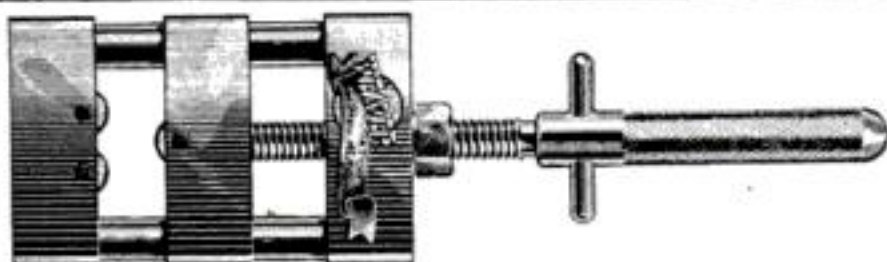
5703 Front St., Galesburg, Kan.
668PS North 4th St., Columbus, O.

**SHAW
MFG. CO.**

SEE THESE TRACTORS AT
INTERNATIONAL FLOWER SHOW
GRAND CENTRAL PALACE, SPACE 250
NEW YORK CITY—MARCH 21 to 26.

and
NATIONAL COUNTRY LIFE EXPOSITION
COMMERCIAL MUSEUM, SPACE 547
PHILADELPHIA—APRIL 11 to 16.

MASTER KNURLING TOOL



FOR PRODUCTION OR OCCASIONAL JOBS

on lathe, drill press or hand tool. Knurls clean uniform pattern on stock up to one inch in diameter. Quickly adjusted. Precision built of high grade tool steel. Medium diamond pattern rolls furnished as standard. Other patterns on request. \$9.75 Postpaid. Money Order or cash. Money back guarantee.

MASTER KNURL TOOL CO.
P. O. Box 1548 San Diego 10, Calif.

**A TOOLSHOP
IN YOUR HAND**



THERE'S ONLY ONE GENUINE HANDEE

First tool of its kind—today's finest. Smooth, steady power at your fingertips. Easy to handle. Make ship, plane and train models, bookends, costume jewelry. Grinds, drills, polishes, routs, carves, sands, saws, engraves on metal, wood, plastic, glass, leather, etc. 25,000 r.p.m. AC or DC. Wt. 12 oz. With 7 accessories \$20.50. In case with 40 accessories \$27.50. At stores or sent postpaid. A fine gift for a friend or yourself. CHICAGO WHEEL & MFG. CO., 1101 W. Monroe St., Dept. PO, Chicago 7, Ill. Free 52-page manual.

HANDEE

**TOOL OF
1001 USES**

Amazing Money-Saving Invention

**SIG-NA-LITE
FOR CARS WITH
OVERDRIVE**



1940 or Later—DeSoto, Chrysler, Kaiser, Frazer, Hudson, Studebaker, Willys, Nash, Packard, and '49 Ford, Mercury, Lincoln!

With SIG-NA-LITE you get utmost benefit from your overdrive. **AUTOMATICALLY FLASHES GREEN LIGHT THE INSTANT CAR IS READY FOR OVERDRIVE.** Eliminates guesswork or forgetting. Saves gas and oil. Reduces engine wear. Anyone can install in 5 minutes. Beautifies dash. Chrome finished with green jewel. Complete with fittings and instructions. Send check or Money Order to

\$2 Post Paid in USA

C. D. HILL PRODUCTS, Dept. PS3
5227 Parker Ave., Chicago 39, Ill.

ONE-MAN SAWMILL LESS THAN \$225.00
Easy To Turn Trees Into Money

Makes lumber, ties, shingles, crates, lath, studding, siding.



Belsaw Models

in 10 to 24 foot sawing lengths. **MECHANICAL FEED,** accurate set works and positive dogs. Use tractor or old auto engine for low cost power. Thousands used for commercial sawing. Pays for itself quickly. Send post card today for FREE booklet, "How To Make Lumber" and Catalog of Woodworking Equipment.

BELSAW MACHINERY CO., 2846-X Field Bldg. Kansas City 2, Mo.
315 Westport Road

GENERAL ELECTRIC & WESTINGHOUSE MOTORS

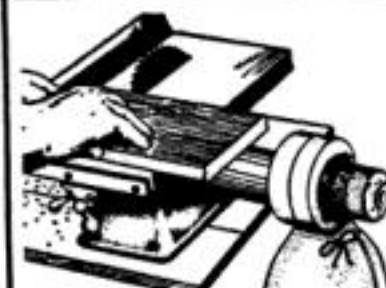
(Brand New, Not Gov't Surplus)

HP	VOLTS	TYPE	PRICE
1/6	110	Split Phase	\$11.95
1/6	110	Capacitor	17.50
1/4	110	Split Phase	12.50
1/4	110	Capacitor	19.50
1/3	110	Split Phase	15.50
1/2	115	Capacitor	35.00

CANAL ELECTRIC CO., PS 3, 310 Canal St., NYC 13, N. Y.

DUST-O-VAC

the Dust & Chip Collector for Home Workshops and Industry



DUST-O-VAC collects and bags wood and plastic chips, wood and metal dust, wood shavings. Free Bag . . . Attaches to circular saw, planer, band saw, grinder, belt or disc sander, shaper, drill press with shaper or sander attachment, spindle shaper, wood lathe or jig saw. 110 A.C., D.C. Free

\$19.95
UNIVERSAL YONKERS CORP.
137 Alexander St. S-3 Yonkers 2, N. Y.

Free Ship. east of Miss. West of Miss., add \$1. Check, M. O.

EARN A STEADY INCOME

Sharpen CIRCULAR SAWS

Improved Acme Circular Saw Sharpener sharpens saws 6" to 60" Rip, Cross-cut, Combination, Dado, even planer knives. Easy to operate, accurate—fast—safe. Bevels 45°, Gums, Joints. • You can profit with this machine.

Write for details.

BURR MFG. CO.

8943-AA VENICE BOULEVARD
LOS ANGELES 34, CALIFORNIA

Thousands of Circular
saws need sharpening
every month.

NEW Pocket MICROSCOPE

3 different magnifications. 20, 40 and 60 power, instantly, at the flick of a finger. Ring type fine focusing control.

High accuracy—for use in factory, show-room, field. Requires no slides, no pre-arranged conditions, no special light source. A compound microscope with precision ground and polished lenses, hard-coated to admit more light, reduce glare and eliminate reflection. Full, flat field of vision. 5 1/4" long (closed). Weight 3 oz. Life-time baked enamel and triple-chrome plated finish. **\$14.50** POSTPAID

SCHOENIG & CO., Inc.

Dept. 3PS, 9 Rockefeller Plaza, New York 20, N. Y.

AIR
RIFLES

BENJAMIN

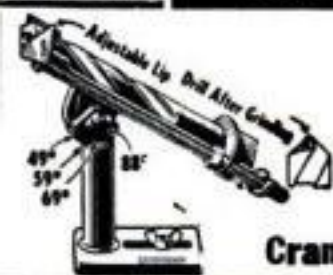
AIR
PISTOLS

PIONEERS - LEADERS

SEND FOR FREE FOLDER OF LATEST MODELS TODAY
If you want a REAL GUN for PRACTICAL USE inside or outdoors get a SAFE - CLEAN - ECONOMICAL - BENJAMIN with Adjustable Power and Amazing Accuracy. For BEST RESULTS use BENJAMIN H-C PELLETS. WRITE AT ONCE. BENJAMIN AIR RIFLE CO., 811 MARION ST., ST. LOUIS 4, MO.

NONE
BETTER!

SUPER DRILL GRINDER



Sharpens round shank drills from 3/32" to 1 1/2" in diameter, up to 6" long. Grinds old drills like new in 4 different point angles, using hand or power grinding wheels. Money-back guarantee.

Price only \$2.95

At Dealers or Postpaid

Crandall Mfg. Co. 1512 W. Slauson, Dept. FB-39, L. Angeles 44, Calif.

BARGAIN!

HIGH SPEED ROTARY FILES

Set of 5 Assorted	\$ 2.00
" " 10	3.75
" " 20	7.25
" " 30	10.00

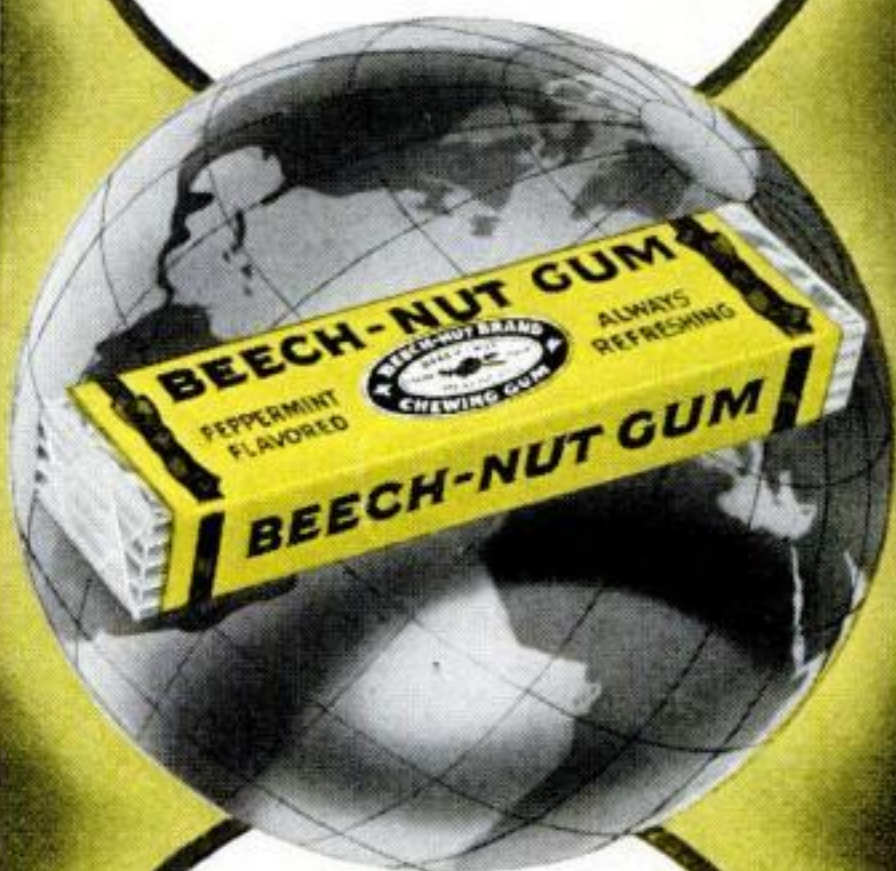
1/4" shank



WE BUY SURPLUS TOOLS

SID TOOL CO., 183 Grand St., N. Y., N. Y.

Flavor
makes all the difference
in the world !



And there's one thing you
can always depend upon...
the consistently high qual-
ity and fine flavor of

Beech-Nut GUM

It's "Always Refreshing"

REMOTE POWER CONTROLS

WORK AT ANY DISTANCE—TO TURN



- ★ Dampers, Vents, Valves
- ★ Television & FM Antennas
- ★ Camera Controls
- ★ Radio Dials
- ★ Motor Speed Controls
- ★ Precision Remote Indicators

When shaft of one unit is turned, other will follow precisely to the same position. Develops 2½ lb. in. of torque. Simple electrical connections. 4½" dia. x 5½" long. Solid bronze corrosion proof housing. Operates on 115 V 60 cy AC. Complete instructions.

Stock No. SEL-69 (Allow postage for 26 lbs. per pair)

\$9.95 Pair

REMOTE INDICATORS

for use on . . .



- WEATHER VANES
- LIQUID LEVELS
- TV AND HAM ANTENNAS
- FILM FOOTAGE—LENS FOCUS
- HUNDREDS of other uses

When shaft of one unit is turned other will follow accurately to the same position. Works at any distance, with only simple electrical connections. 2¼" dia. 3½" long. Operates on 115V 60 cy AC. Complete instructions.

Stock No. SEL-50

Add postage 30c east of Rockies, 50c west

\$3.95 Pair

OSCILLATING ELECTRIC WINDSHIELD WIPER MOTOR

Car-Owners—Hobbyists—Camera-Fans—Displayers



PLAY SAFE! Add a rear windshield wiper to your car. Great for hobbyists or moving displays. Makes fine agitator for photographic use. Operates 5-10 volts AC or DC, 30 to 200 (135 degree arc) strokes per minute depending on voltage. Extremely powerful. Easily installed. Draws 2 amp. at 6 volts. 3" x 3" x 2".

Stock No. AMO-92

Reg. Price \$5.95—Now . . .

\$1.95 Each

With transformer for 115 V 60 cy operation. Stock No. AMO-64 . . . **\$2.95** Each

Mail Orders add 25c each for postage and handling

DUBIN ELECTRONICS CO., INC.
103-02 Northern Blvd., Corona, N. Y., Dept. PS39

OTTAWA Buzz Master

A faster brush cutter and wood sawing machine. Propels itself while cutting saplings and brush. 7 H-P motor. Many outstanding and exclusive features. Available attachments: sickle bar, rotary tiller, sprayer, air compressor, snow plow and pulley for belt work. Thousands in use. Send for FREE booklet.

OTTAWA MFG. CO., 1-901 Brush Ave., Ottawa, Kansas



No Other Like It!



ONLY \$9.75 Post Paid

Pat. No. 2,188,175

JET PERFORMANCE FOR YOUR CAR WITH VAPOJET

Install this amazing new water injector on your car, easily, quickly, and notice the immediate difference! FASTER STARTING, amazing power, users report 20% INCREASED GAS MILEAGE with VAPOJET, the war developed water injector that prevents vapor lock, removes carbon and stops overheating. Only VAPOJET gives you AIRCRAFT PERFORMANCE at the surprisingly low price of only \$9.75 postage prepaid in U.S.A. \$2.00 deposit on C.O.D. Fits all cars. Specify car and number of cylinders. Complete including all fittings and connections—NOTHING ELSE TO BUY. Order yours TODAY!

VAPOJET MFG. CO.

11424-A Biona Drive, Los Angeles 34, California

Gentlemen—Rush me

VAPOJET. Enclosed is \$

NAME

ADDRESS

CITY STATE

PRECISION BUILT Barron DRILL PRESS TOOLS!

15

Essential workshop operations now accomplished on any drill press with famous Barron Tools and Accessories . . . Planing, mortising, rabbeting, shaping, surface sanding, polishing, tenoning, grooving, routing, drum sanding, beading, paneling, veining, edging, molding, dovetailing, etc.



FREE! Workshop Guide

Including a complete catalog of time-proved, precision built Barron Workshop Tools. Convert ANY drill press into your most versatile, low cost power tool.

FULL 10 DAY MONEY BACK GUARANTEE

BARRON TOOL CO., INC.

370 ARCHITECTS BLDG.

DETROIT 1, MICH.



\$7.50

Drill Press Planer

\$5.95



Rotary Surface Sander



\$9.00

Safety Shaper Cutter and Blades

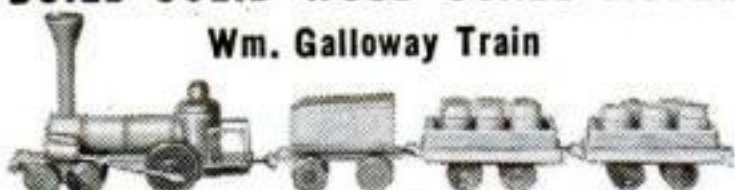
Set of 6 Hi-Speed Router Bits

\$9.50



BUILD SOLID WOOD SCALE MODEL

Wm. Galloway Train



• Realistic StromBecker model of first freight train in U. S. Length 14½", height 3½". Kit complete with ready-shaped parts for easy assembly, \$1.00 . . . Other StromBecker Kits: Piper Cub Supercruiser, 50¢; Submarine Nautilus, 35¢; Rock Island Rocket Streamliner, \$1.50; many more.

Ideal for display on mantle, desk, or in collector's group. AT YOUR TOY OR HOBBY DEALER

Send for free Catalog describing models.

STROMBECK-BECKER MFG. CO., Dept. PS-3, Molino, Ill.

StromBecker



HEAVY CAST ALUMINUM DOUBLE EXHAUST BLOWER

ONLY \$16.85

For workshops, labs., kitchens, cellars, electronic tube cooling . . . or any use where air blowers are needed. Install it yourself with any household tools. Double intake and exhaust from 2 balanced wheels. Flanges for

attachment to ducts. Cont. duty motor, 110 V., A.C. 50-60 cycles. SINGLE EXHAUST BLOWER—Delivers App. 100 CU. FT. AIR per MINUTE—\$11.25. Shipped Parcel Post. Pay slight charge on arrival. Send check. M.O. Money Back Guarantee. Free lit. Universal Yonkers Corp. (S-3), 137 Alexander St., Yonkers 2, N. Y.



THE TX-8 GEIGER COUNTER

The latest, lightest and most sensitive device ever developed for locating all radioactive mineral deposits. Simple to operate. Estimates quality and quantity of ore discovered. Write immediately for details and prices . . .

OMAHA SCIENTIFIC SUPPLY CO.
DEPT. 15, 3623 LAKE ST., OMAHA 4, NEBR.

Compare features when you buy a plane!

On any planing job, you want good control, a balanced, comfortable grip, perfect results. Professional woodworkers will tell you that you get all three in a Millers Falls plane — and they're *right*!

Only in Millers Falls planes will you find a three-point bearing lever cap, a solid tool-steel cutter, a perfectly-fitting cap . . . because they're Millers Falls *exclusives*. But more — find out how comfortable those hand-fitting solid rosewood knobs and handles are, how sensitive your cutter adjustments, side or depth.

Best of all, Millers Falls planes cost no more.

See them at your hardware dealer's. Millers Falls Company, Greenfield, Mass.



The plane you need

Smooth planes — for finishing broad, flat surfaces or reaching into low spots.

Jack planes (illustrated) — for rough, heavy cuts and truing up of board edges.

Jointer planes — for final finishing, or dressing edges before joining.

Block planes — for cross-grain work.

(Many others for special work)

**MILLERS FALLS
TOOLS**

SINCE
1868

Millers Falls Tools

FREE!
SAMPLE!

That **GLOWS IN THE DARK!**

AN EASY WAY TO MAKE BIG MONEY

Be the first to sell sensational luminous house numbers, light switch plates, wall protectors, cord pulls, novelties, etc. Also luminous pictures, statues, decals, and a host of religious, nursery and other objects **THAT GLOW IN THE DARK**. Sell on sight. *Get into this new and growing industry.* ENORMOUS DEMAND . . . NO COMPETITION . . . BIG PROFITS. Represent a large manufacturer, established over 35 years. Write **AT ONCE** for liberal **MONEY-MAKING** offer and **free sample** to show you how they **GLOW IN THE DARK**.

Madison Mills, 303 Fourth Ave., Dept. R-5, New York 10, N.Y.

IMMEDIATE DELIVERY



FASTER IN TRAFFIC THAN A CAR
at a fraction of the cost!

AUTOMOTIVE SALSBUURY

**SEE AND DRIVE THE MOST COMPLETELY
AUTOMATIC VEHICLE EVER BUILT**

Write for Free Folder & Dealers Name

SALSBUURY MOTORS, DEPT. PS-3

Division of WAYNE MANUFACTURING COMPANY
POMONA, CALIFORNIA

EASY
TERMS

ARC WELDING
FOR PROFIT OR PLEASURE

60 LBS. OF READY MADE PARTS

Only
\$24.95

**BUILD YOUR OWN
HEAVY DUTY WELDER**

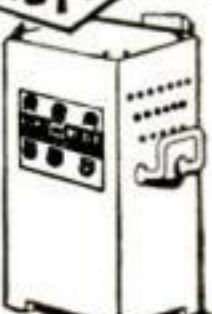
SAVE
BUY ONLY
NECESSARY
PARTS

All parts Ready-Made and easy to assemble. You can do all around welding on steel, cast iron and other metals after only a few hours practice. Illustrated instruction manual included. Sold on 30 Day Money-Back Guarantee!

FREE: Write today for fully illustrated Pamphlet S-3.

Gives
100%
penetration. Welds are
stronger than original
metal. Operates on 110
or 220 AC.

ATOMIC ARC WELDER CO.
1039 So. 19th St., OMAHA, NEBR.



Everything in Radio at Lowest Prices!

FREE

Send for
ALLIED'S
180 Page
Catalog



**BUILDER'S KITS
TELEVISION SETS
HI-FIDELITY SOUND
AMATEUR GEAR
THOUSANDS OF PARTS
TUBES, TOOLS, TESTERS
BOOKS & DIAGRAMS**

*Everything for
Servicemen, Engineers,
Experimenters, Builders,
Soundmen, Amateurs*



Radio's Leading Buying Guide

Get ALLIED'S 1949 Catalog—biggest and most complete in Radio. Get *everything* you need from the world's largest stocks of top-quality equipment—at down-to-earth money-saving prices. Have the advantages of speedy reliable shipment, expert personal help, and complete satisfaction on every purchase. Get more for your money at ALLIED—Radio's Largest Supply House. Send today for your **FREE ALLIED Catalog**—the preferred Buying Guide to *everything* in radio and electronic equipment.



ALLIED RADIO

ALLIED RADIO CORP.,
833 W. Jackson Blvd., Dept. 7-C-9
Chicago 7, Illinois

FREE

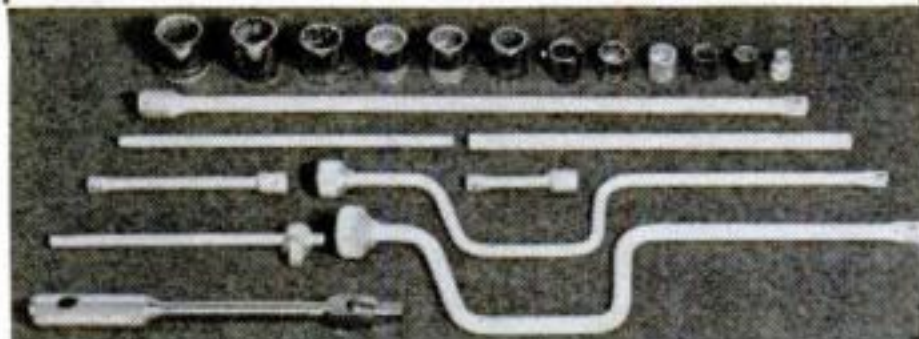
☐ Send **FREE** 1949 ALLIED Catalog.

Name.....

Address.....

City.....Zone.....State.....

SOCKET SET



\$20.00 VALUE—PRICE \$9.50

Our purchase of over 200,000 wrenches as unused U. S. Air Force surplus makes this low price possible. All tools are NEW. All sockets are 12 point and plated. All tools are NEW. They are well-known popular standard makes such as Plomb, Snap-On, etc. Set consists of 22 pieces, 1/2" and 3/8" drive. Shipping weight 10 pounds. This is what you get.

- | | | |
|-----------------|------------------|----------------------|
| 1—5/16" Socket | 1—13/16" Socket | 1—2" Extension |
| 1—3/8" Socket | 1—7/8" Socket | 1—4" Extension |
| 1—1/2" Socket | 1—15/16" Socket | 1—18" Extension |
| 1—9/16" Socket | 1—1" Socket | 1—T Handle |
| 1—5/8" Socket | 1—1 1/16" Socket | 1—1 1/2" Flex Handle |
| 1—11/16" Socket | 1—1 1/8" Socket | 1—3/4" Speed Handle |
| 1—3/4" Socket | 2—Bar Handles | 1—1/2" Speed Handle |

All sets shipped via parcel post same day we receive order.
Money Order or Check, 25% Dep. on C.O.D.'s.
Prices F.O.B. Fresno.

ARMY SURPLUS SALES

OF FRESNO

1820 TULARE ST.

FRESNO, CALIF.

LEARN ELECTRIC MOTOR REPAIR AT HOME IN SPARE TIME



Train for good pay in an uncrowded field

Based on this big 560-page **Electric Motor Repair** book you can train quickly for fast, profitable repair, installation and maintenance on practically any electric motor. Explains motor trouble diagnosing, repair and rewinding. Covers A-C and D-C motors, synchronous motors and generators, etc., and motor control systems. Quick guides show how to handle specific jobs. Over 900 special pictures and diagrams make study easy.

See Book on Trial—No Money Down

Just write name, address and occupation plainly in margin and mail ad. We'll send book and after 10 days you can pay for it plus few cents postage, or return it postpaid (postage paid on cash order; same return privilege). Satisfy yourself. Write now.

Only \$5
for the complete
training

Dept. PS-39, **MURRAY HILL BOOKS, Inc.**
232 Madison Ave. New York 16, N. Y.

Build YOUR OWN BOAT



Complete parts cut to exact size—ready to assemble. Marine waterproof plywood, rustproof oarlocks. Ideal for car top. Also models with laminated frames; mahogany decked runabouts. Build for sale at attractive profit. Exclusive franchise to local builders. Send 10 cents (dime) for illustrated literature.

\$39⁵⁰
and up

OZARKA

739 WASHINGTON AVE.

WOODSTOCK, ILL.



**SPORTSMEN! GIANT SPOOL Now Yours On
SPECIAL INTRODUCTORY OFFER
DIRECT-TO-YOU FROM MILL**

MEN! Here's your chance to get this amazing strong, almost unbreakable DuPont **NYLON** thread for sewing leather and canvas, salt water fishing, net mending, bamboo rod wrapping. Used by Air Force on parachutes. **SEND NO MONEY.** Just name and address. Specify black or white thread. On arrival pay postman \$1.69 plus C.O.D. postage. Test for 10 days. If not delighted, return for money back. Limited offer. Order **TODAY**. 2 Spools... \$3.29
LEEWARD PRODUCTS, Dept. F-48-C, 149 W. Madison, Chicago 2, Ill.

RED GARDEN TRACTOR

NO BELTS • NO CHAINS
POWER TURNING

PLOW, DISC,
HARROW, CULTIVATE
and PLOW SNOW
3-4-5 H.P.
Easy to Operate • Economical

RED-E IS DIRECT
DRIVE-ALL GEARS
ENCLOSED.

BUY DIRECT
from FACTORY
at FACTORY
DISCOUNT
write for
BIG, FREE
CATALOG

RED-E
TRACTOR CO.
Box 273
Richfield, Wis.



OWN A FAMOUS MOTO-TOOL

The "Pocket-Size
Machine Shop"

HIGH-SPEED STEEL CUTTERS —AT NO EXTRA COST

No modern home workshop is completely equipped without MOTO-TOOL...the correctly balanced motor-in-hand tool. It grinds, drills, routs, curves, polishes...without vibration. Higher speed does work better, faster, on practically any material. MOTO-TOOL Kit No. 2 includes high-speed-steel cutters for longer life, better work. MOTO-TOOL is backed by over 12 years of industrial use...packs years of pleasure. Due to wide popularity and increased production, Dremel's pre-war prices still prevail!



Moto-Tool No. 2
With Emery Point

\$16.50

MOTO-TOOL KIT No. 2
With 23 Accessories
(High-Speed Steel Cutters, Grinding Wheels, Polishing Accessories)

\$23.50



NEW DRILL PRESS—only

This 12" high precision drill press is ideal for model making, wood carving, routing, etc. Utilizes No. 2 Moto-Tool.

\$9.95

(Less Moto-Tool)



Look for These Moto-Tool Features

Approximately 27,000 R.P.M. plus dynamically balanced armature provides vibrationless finger-tip control. Moto-Tool has oilless, sealed bearings • Patented automatic chuck lock pin • Over-size armature shaft—hardened, ground, polished • 110 Volt, AC-DC motor • Sliding snap-type switch • Cord protector • Shockproof bakelite housing • Dust-filtered aircooling system • Weighs only 13 oz.

MONEY-BACK GUARANTEE: Buy Dremel Moto-Tools from your dealer. If he cannot supply you, order direct on 5-day trial, money-back guarantee. Shipped postpaid for payment in full (Send check or money order); or, send only \$2 now and pay postman balance plus postage upon delivery. Catalog of Dremel Tools and Accessories FREE.

DREMEL MFG. CO. Dept. T129-C Racine, Wis.

BUILD YOUR POWER TOOLS

WITH POLY BALL BEARING ARBORS

HEAVY DUTY GRINDER

3/4" x 17 1/2" precision spindle, self-lubricating ball bearings, heavy casting, V belt, 3 step pulley driven through rear or base.

ONLY

\$18.25

Ship wt. 13 pounds



Model D-12
Pictured

FREE!
Write for
POLY illustrated literature.



C4-1/2
Pictured

POLY BALL BEARING ARBORS
C4-1/2 x 12 1/2 spindle, housing 2 x 8, \$7.95 pp.
C5-5/8 x 12 1/2 spindle, housing 2 x 8, \$8.45 pp.
C6-3/4 x 12 1/2 spindle, housing 2 1/4 x 8, \$9.45 pp.
D8-1 x 17 1/2 spindle, housing 2 5/8 x 11, \$18.75 pp.

SHAPER ARBORS—Free literature on request.

POLY PRODUCTS, 2032-B E. Walnut, Pasadena 8, Calif.

AUTOMATIC FLOOR LIGHT

FOR FORD AND MERCURY CARS

1941 Thru 1948 Models

OPERATES WHEN DOOR IS OPEN

Brightly Illuminates Floor and Running

Board for Safety and Convenience.

Simple Installation — No Holes to Drill

\$3.00 PER PAIR — POSTPAID

Send Postal Money Order — No C.O.D.

Not Sold in Accessory Stores.

AIRCRAFT METAL PRODUCTS

4010 Richmond N.W., Grand Rapids 4, Mich.



"1949" MODERN MOWER

ALL PURPOSE Rotary Lawn Mower

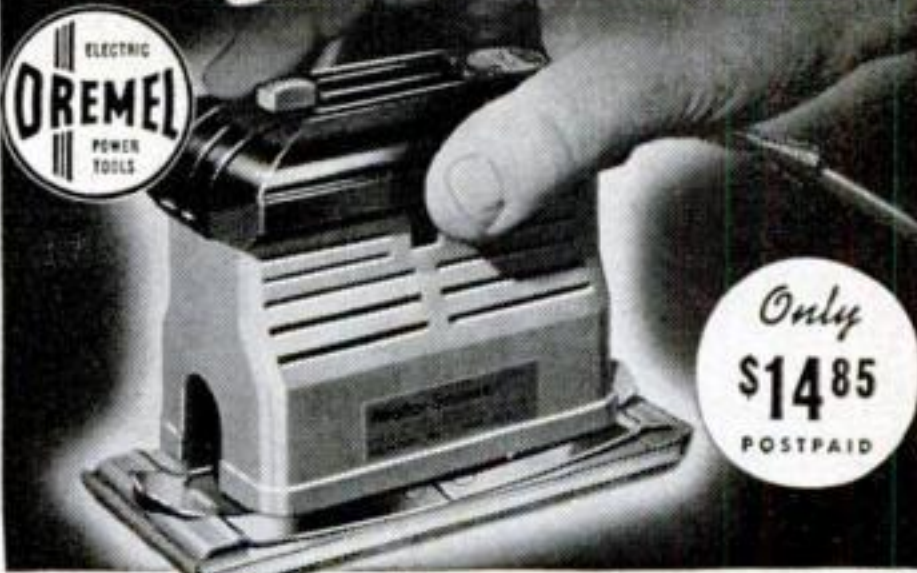
Does a smooth clean job on the finest lawn and will also cut tall grass and weeds along fences, alleys, etc. Light weight, sturdy aluminum chassis. Timken bearing spindle. Ball bearing wheels with semi-pneumatic tires. Available with or without engine. Write for free Circular.

CAN YOU SELL? Ask about our special offer to dealers and salesmen.

AIR-ELECTRIC MACHINE CO., Inc.
LOHRVILLE 3, IOWA, U.S.A.



NEW Electric SANDER



Only
\$14.85
POSTPAID

Amazing MOTO-SANDER AND POLISHER

SAVES TIME—SAVES "ELBOW GREASE"

Here's a machine that takes the hard work out of two tough jobs...sanding and polishing. "Moto-Sander" is so easy to handle that a child can use it...so fool proof that, with it, even a novice can do a craftsman-like job. Moto-Sander's fast, straight-line action (non-rotary) eliminates any possibility of wood burns or scratches. Does a magically smooth job of sanding...gets into corners and places others can't reach. All you do is guide it! There are dozens of time and moneysaving uses in every home and shop for this inexpensive machine. Use Moto-Sander to get smooth sanded finish on furniture, painted walls, boats, bird houses, scale models, etc. Use it also for speedy, effortless polishing of waxed furniture, automobiles and other surfaces—simply by removing sandpaper and clamping on polishing pad. Moto-Sander is the lightest, most practical electric sander on the market—the only one of its kind. Furnished with 6 assorted sheets Garnet paper for sanding...plus felt pad and sheepskin for wax polishing. Operates on alternating current. Thousands of satisfied users.

USE MOTO-SANDER AROUND THE HOUSE

- Sand Furniture and Woodwork
- Sand Walls before painting
- Polish the Family Car
- Polish Waxed Furniture

MONEY-BACK GUARANTEE: Buy Moto-Sander from your dealer. If he cannot supply you send only \$14.85 (check or money order) and we will ship postpaid; or, send only \$2 now, and pay postman balance plus postage upon delivery. Your MONEY-BACK if not delighted after 5 days' trial.

DREMEL MANUFACTURING CO.
Dept. SP129-C • Racine, Wis.



EASY FOR
AWKWARD PLACES



SANDS FLAT
SURFACES EVENLY



GETS INTO
TIGHT CORNERS



ROUNDS CORNERS
LIKE MAGIC

New IMPROVED Electric MOTO-SAW

Only **\$5.85**
(with 3 Saw Blades)
Postpaid



SAFE AS A HAND SAW
JUST GUIDE IT!

The versatile
MOTO-SAW

is as safe as a handsaw. A touch of the trigger switch sets it going...releasing stops it instantly.

Saws to Center
of 19" Widths
No Limit to Length
of Stock it Will Cut

**THOUSANDS OF
SATISFIED USERS**

AVERAGE CUTTING SPEED ONE FOOT PER MINUTE

Moto-Saw works more like magic than any tool you ever saw! Takes no effort to run...no perceptible pressure to feed...only a trifle heavier than a hand scroll saw, and better balanced in your hand. Runs 7200 strokes a minute...leaves no rough edges...easily cuts intricate scroll designs in medium hard wood up to 5/4" thick. Blade holder faces blade 4 ways...permits sawing sideways as well as forward and backward. Sturdily constructed...only two moving parts...never needs oiling...requires no bench room or floor space. Operated on alternating current. Thousands of satisfied users.

MONEY-BACK GUARANTEE:—Buy Moto-Saw from your dealer. If he cannot supply you, send only \$5.85 for Moto-Saw and 3 blades, postpaid; or, send only \$1.00 now, and pay postman balance plus postage upon delivery. MONEY-BACK if not delighted after 5 days' trial.

DREMEL MFG. CO. • Dept. S129C • Racine, Wis.

SANDEE Specials



MUFFLERS Steels & Aluminums with a MELLOW Motorboat Tone

SINGLES, Chev., V-8, Plymouth, Steels \$5.50, Aluminum \$7.00. Chry., Olds., Buicks, etc., Steels \$7.50, Aluminum \$9.00. V-8 and MERCURY DUALS, Steel \$17.50, Aluminum \$21.00. '49 Ford Duals, \$2.50 extra. Split Manifold Sets, Steels \$35.00, Aluminum \$45.00.

SANDEE ALUMINUMS ARE GUARANTEED FOR LIFE OF YOUR CAR

Streamline Your Car with SANDEE FENDER SKIRTS... \$17.20 pr.

Sparkling beauty you'll like. Constructed of heavy gauge body steel, finished in prime, perfect fit.



For Ford, Chev., (except Fleetline), Merc., Plym., De Soto, Chrys., Dodge, Kaiser, Frazer, Buick (except 42-48 Super), Olds. Series 60 & 70 1937-40, Pont. 6 1939-40.

Beautify your car... bring out the flowing lines inherently designed there.



DIXIE-WESTERN DUAL INTAKE MANIFOLDS for V-8 FORDS AND MERCURYS \$15.00

Gas Line and Throttle Kit \$2.50 extra
Chrome Plated Velocity Stacks \$3.00 pair.

By test: Increased acceleration by 26%—increased power and speed by 11%.

All DIXIE WESTERN manifolds are brightly polished cast aluminum.

ATTENTION service station men, garage men, and auto parts store owners; we have a profitable dealer's discount on quantity orders of any of the above merchandise.

SANDEE MUFFLER COMPANY
Box 296 La Tijera Sta. Dept. PS 3
Los Angeles 43, California

WE SHIP C.O.D.

Please ship—Mufflers, —Dual Sets ☐ —Singles ☐

—Fender Skirts ☐ —Dixie Western Manifolds ☐

Make of Car. — Model — Year —

Name —

Address —

City — State —

Check Enclosed \$ — Ship C.O.D. \$ —

SANDEE MUFFLER CO.

Factory Address
5643 Corryne Place Culver City, California

Only \$16.95 Complete DUAL PURPOSE SPRAY GUN

Uses Only 25 lbs. Air Pressure
FLOCKS and SANDBLASTS

AT HOME: You can refinish Lamps, Radios, Book Ends, Statues and hundreds of things with lovely colorful flocking. ETCH GLASS: Many designs and initials can be sandblasted on shower doors, ash trays, glassware. AUTO INTERIORS: Transform ugly dirty auto interiors to "new car beauty" with a BLASTO DUAL PURPOSE SPRAY GUN. Merely spray flock similar to Velvet, Plush, Suede and Mohair inside your car. ANTIQUE WOOD... REMOVE PAINT, MAKE EXTRA MONEY by doing any or all the above for profit. BLASTO is highest quality and carries a 5 day money-back guarantee. Operates on small air compressor. Send \$16.95 cash, check or money order for postpaid delivery. Write for free information. Full line of Flocking Supplies.



BLASTO SPRAY GUN MFG., Dept. PS-3 7007 Haas Ave., Los Angeles 44, Calif.

New Quick Selling CELL-U-MOP... others make BIG MONEY

DOES THE WORK OF
6 TOOLS IN 1
Holds 20 times its
weight in water



Hands
Never
Touch
The
Water

Can Be
Put In
Boiling
Water

"Enclosed find 56 orders representing 9 1/2 hours work on Monday and Tuesday." "Enclosed are 12 orders secured after supper this p.m."

Housewives Pleased

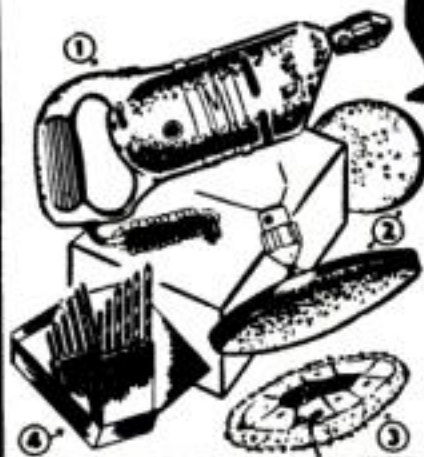
Everyone that sees this outstanding CELL-U-MOP immediately want one... That's the reason our distributors are so successful... For MOPPING, WAXING, WALLS, WINDOWS, AUTOS and CLEANING RUGS. Sells quick to Taverns, Clubs, Hotels, Hospitals, Stores, Restaurants, Homes, etc. Drain Bracket squeezes out water thoroughly. Write for FREE particulars

CLOSED CELL-U-MOP CO., Dept. PS-3, FREEPORT, ILL.

Send for FREE Catalogue

SAVE
\$5.00

DRILL, SANDER, BUFFER & 13-Pc. HI-SPEED DRILL



- (1) Cummins 1/4" Electric Drill Jacobs Chuck (Guar. one year).....\$18.95
- (2) 4" Rotary Surface Sander (Aluminum), sponge rubber cushioned complete with 12 sheets sandpaper. \$ 3.50
- (3) 5" Lamb's wool bonnet (for polishing cars, furniture, silverware, etc.).... .75
- (4) 13-Pc. Hi-Speed Drill Set (complete with Hunt container. Sizes range from 1/16" to 1/4").....\$ 3.25

If Purchased Separately...\$26.45
Special On All 4 Items.....\$21.45

NORTON BERGER

Shipped PREPAID

117 MARKET ST. • PHILA. 6. PA.

NEW 30" SHEET METAL BRAKE

Forms angles, channels, vees, flanges, locks, zeas. Handles 26 gage sheet steel, heavier gages of aluminum, copper, plastic, etc. Portable. Can be held in a bench vise, or bolted down. All steel. Wt. 40 lbs. Shipped exp. collect. **\$24.50**



12" BRAKE. Fits in vise to form difficult and compound bends, up to 20 gage steel 12" wide.\$12.50 PP.
18" CURVE FORMER. Handles 16 gage steel 2" to 30" dia. \$10.00 PP.
VISE IRON BENDER. Forms rings, hooks, eyelets, in 1/2" round or square; 1/4" up to 2" wide in bar iron. Price.....\$10.00 PP.

SHEET METAL PLIERS. 21 1/2" wide, \$2.00; 5". \$3.50. Immediate delivery. Order direct, cash or C.O.D., or send for folder.

VICE BRAKE MFG. CO.

1116 So. 27th St.

Dept. S-3

Omaha 5, Nebr.

SPEED AND POWER HANDBOOK



Very latest methods! Build your own Dual Manifolds, Superchargers, "Water Injectors," Hi-Compression Heads, Fuel Saving Devices—easily. **SAVE MANY DOLLARS!** Get racing speed, acceleration, dynamic power increases from any automobile! Build fast stock cars! California roadsters! Hotrods! Get ingenious formulas! Speed secrets! Illustrations! Conversion ideas! Also "Economy Information"—Mileage tricks! Tuning techniques! Picture catalogues. Including "California Restyling Ideas"—Glossy photographs! Drawings! Model revising! Customizing! Streamlining!—\$1.98 complete.

NEWHOUSE AUTOMOTIVE INDUSTRIES, 5941-A4 HEREFORD, LOS ANGELES 22, CALIF.

WORK BENCH



NOBODY BUT NOBODY CAN BEAT THIS VALUE!

This low price is possible only because WE MANUFACTURE & SELL DIRECT TO YOU! CHECK THESE FEATURES: 2" HARDWOOD, GLUED & DOWELED TOP. Bins for parts. Tool rack, 1" bottom shelf with back brace. Spacious drawer, 23-60x32" high. Wt. 100 lbs. Shipped KD with bolts, nuts, Specify Railway Exp. or Rail Freight del. FOB Yonkers.

UNIVERSAL YONKERS CORP. (S-3)
137 Alexander St., Yonkers 2, N. Y.



Here are Real **WAR SURPLUS BARGAINS!**



Gear Head MOTOR



Holtzer Cabot 110 volt AC 60 cycle. Can be used for turn tables, telescope drives, etc. Approx. 1/20 H.P. Output shaft — 50 RPM. **\$14.95**
Stock #406... New only



HALES FIRE PUMP

For fire depts., factories, forest fire protection, etc. 600 gal. per min. Can be operated with 4 or 6 cylinder gas engine. 4 1/2" intake, 2-2" outlets. 265 ft. head at 120 lbs. pressure. Passed by National Board of Fire Underwriters. **\$175.00**
NEW, Stock #407

PLASTIC HOSE

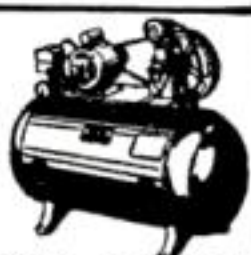
Good for water, oil, air, etc. Will stand 75 lb. pressure. Available in 50, 100 ft. or more lengths.
1/8", 3/16", 1/4" (your choice) per foot. **2c**
5/16", 1/2" (your choice) per foot. **3c**
9/16", 5/8" (your choice) per foot. **4c**
3/4", 1" (your choice) per foot. **6c**
1 1/8", per foot. **8c**



Portable BUZZ SAW

Powered by 6 1/2 HP Briggs & Stratton air cooled gas engine. Adjustable hinge, requires no clutch. 28" blade. Will take up to 12" hardwood. 13 1/8" ball bearing mandrel. Has power take-off. Complete unit mounted on two wheels with 400 x 8 pneumatic tires. Has tow bar for trailing. Wt. approx. 400 lbs. Sold complete or less blade, engine or wheels. Make \$25 to \$50 a day saving wood with this sturdy unit. Write for free Circular. Stock #350.

Automatic AIR COMPRESSOR



Complete, piston type with 10 gal. tank, 1/2 HP capacitor type, AC, 110-220 volt 60 cycle motor. V-belt drive. Will develop 75 lb. pressure—approx. 2 cu. ft. Brand new. Stock #340... **\$79.50**

Assemble yourself and save \$10. ABOVE tank with legs and saddle... **\$119.50**

AS ABOVE — 1/2 HP motor, 2 cyl. Westinghouse compressor. 3 c.f.m. at 75 lbs. **\$109.50**



Portable AIR COMPRESSOR

Electric motor driven, portable spray painting unit for jobs requiring a larger quantity of material. Piston type, single cyl. air compressor has 2" bore by 1 3/4" stroke. 2.86 CFM. Max. working pressure 40 lbs. Mounted on base. Equipped with safety valve & drain cock. 1/2 HP capacitor type motor. 110 volt AC, with cord and plug. 20 ft. air hose and fittings. Ship. wt. 45 lbs. Brand new. Stock #348... **\$42.50**



Kellogg AIR COMPRESSOR

Kellogg Model 241 air compressor. Piston type with 2" x 1 3/4" bore. Capacity of 2.8 CFM at 100 lbs. V-belt drive. 3/4" shaft. Can be run with 1/2 or 1 HP motor. Delivers oil free air. Max. recommended working pressure 150 lbs. Stock #349, NEW... **\$149.50**



AC ARMY LIGHT PLANTS

New 750 watt 110 volt, 60 cycle light plant with Briggs-Stratton model AP gas engine. **\$149.50**
Stock #315

New 1000 watt 110 volt, 60 cycle light plant with Briggs-Stratton model BP gas engine. Stock #316... **\$179.50**

New 2500 watt 110 volt, 60 cycle light plant with Briggs-Stratton model Z 6 HP gas engine. Stock #317, New **\$265.00** Used, like new **\$225.00**
Add \$10 for tools and spare parts.

Rebuilt 5000 watt 110 volt, 60 cy. light plant with automatic remote control. Powered by Jeep 4 cyl. gas engine. Rebuilt like new and guaranteed. Stock #318... **\$625.00**



7,500 watt, 110 volt AC light plant powered by VE-4 Waukesha 4 cyl. gas engine. Continental or Hollinsworth Generator. Remote control starting with 100 ft. starting cable, and 100 ft. of 3 wire #6 cable. Complete switch board. Used, like new. **\$675.00**
Stock #347
Add \$65.00 for transformer to make plant 3 phase, 220 volt.

10,000 watt 110 and 220 volt, 60 cy. light plant with automatic remote control. Powered by Jeep 4 cyl. gas engine. Rebuilt like new and guaranteed. Stock #319... **\$900.00**

PORTABLE DC LIGHT PLANT

3000 watt 110 volt DC powered by new 6 HP Briggs-Stratton model ZEP gas engine. Rebuilt generator. Generator alone lists at \$243.00. Has volt meter, rheostat, 4 female plugs, and ball bearing 2.75 x 10 rubber wheels. Guaranteed. Stock #320... **\$185.00**

SPECIAL!

300 watt, 110-220 volt A.C. 60 cycle light plant powered by 1 1/4 H.P. gas engine. Mounted on base. Stock #409
New... **only \$99.50**

GENERATORS

AC—750 watt 110 volt 60 cy. with voltmeter, rheostat, 3/4" shaft. Dimensions: 9"H x 12"W x 13"L. Wt. 52 lbs. Shielded to prevent radio interference. Mfg. by Elcor. \$125.00 value. NEW, **\$69.50**
Stock #322, OUR PRICE



AC 1000 watt—Stock #403... **\$79.50**

DC—300 watt, 12 volt, 2900 RPM, heavy duty, with current cut-out relay, high and low switch, 30 amp meter. Can be bought less shaft and base to be used direct mounted to Briggs-Stratton 1 HP engine. NEW, Stock #323... **\$700**

Complete with base, shaft and bearing. NEW, Stock #324... **\$159.50**

Horns and Howlers



Motor driven, (not a vibrator). Heavy duty with great power and long life. Adjustable for high, medium or low tone. 110 volt AC current. Weather proof. For alarm or signal horn on boats, school yards, factories, etc. List price \$47.00. NEW, Stock #302, OUR **\$94.50**
PRICE



Productimeter COUNTER

Manufactured by Durant. Readings up to 5 figures. Rotating drive shaft. NEW, **\$3.95**
Stock #405... only

HALF TON WAGON

"Assembled or in kit form"



Stock #332

Heavy duty wagon with plate aluminum body 24" x 42". 5/8" steel axle with ball bearing wheels. Heavy rubber tires. Ideal for newsboys, farms, grocers, parts dept., etc. Approx. wt. 88 lbs. Nothing like it now on the market.

WRITE FOR FREE CIRCULAR



KITCHEN EXHAUST FAN

For kitchens, attics, basements, etc. 8" ball bearing fan Mfg. by Robbins & Meyers. Can be run vertically or horizontally, 110 volt AC 60 cycle motor with plug and cord. New in original box. Stock #401... **\$11.95**

ELECTRIC RUBBER CABLE (all new) CORD SETS



Extension cords, 100 ft. heavy duty. Plug, socket and guard. Number 16 wire. Worth at least \$10. Stock #310. **\$5.95**
OUR PRICE

Same as above — 50 ft. length. Stock #311... **\$4.25**

Heavy Duty Electric Cable

3 wire #10 Super Cable, Stock #408
100 ft. ... **\$22.00** 250 ft. ... **\$48.00**
4 conductor neoprene covered #18 stranded tinned copper wire (two blacks & two whites). Run in parallel gives you #16 gauge. Lugs furnished for parallel run. Water & oil resistant. (Stock #346)
100 ft. 250 ft. 500 ft. 1320 ft. reel
\$4.25 10.00 \$19.00 \$36.00

150 ft. reels, 3 wire #6 with 4, 60 amp Crouse & Hines connectors—2 male & 2 female. Perfect for welders, hay loaders, saws, electric ranges, etc. List price \$190 per reel. Stock #313, OUR PRICE **\$65.00**

BALL BEARING ARBORS



Grinding and saw arbor, has 1 1/2" double end shaft, 11 1/2" long with 2" center pulley. New Departure double roll ball bearings. Right and left hand thread. Self aligning Dodge pillow block. 10,000 RPM. Bearings alone list at \$10. Complete arbor new. Stock #305... **\$4.95**

HI-SPEED GRINDER (not pictured). Has 2 step pulley driven thru rear or base. Stock #328... **\$10.95**



CLUTCH

for motor-scooters, motor-bikes, lawn mowers, etc.

Mercury centrifugal clutch for use with any small gas engine. 3" "A" belt pulley, 5/8" bore, Stock #400, Brand new... **\$9.95**

ALL ITEMS GUARANTEED AS REPRESENTED C & H ELECTRIC Co.

438 W. JUNEAU AVE.
MILWAUKEE 3, WISCONSIN

All prices F.O.B. Milwaukee. 25% deposit required on all C.O.D. orders. No C.O.D.'s under \$10.00. Use stock number when ordering. Many other bargain items not listed—write for our free circulars.

SENSATIONAL FUEL OIL FILTER

**Ends
Burner
Failures**

Caused by
Water, Dirt, Sludge,
and Other Foreign
Matter Clogging
the Lines.

**ONLY THE KLEMM HAS
Chemistone**
The Original Controlled
Porosity Filtering Element



Porous Chemistone absorbs all the dirt and sediment. Can be easily cleaned and used many times over.



**Klemm
FUEL OIL
FILTER**

FOR ALL
RANGES, HOT
WATER HEATERS,
SPACE HEATERS

\$2⁹⁵

Stop Paying for Costly Service Calls. Avoid disappointments, aggravation & expense caused by burner failure. This efficient Klemm Fuel Filter assures dependable burner performance. Provides a constant flow of clean oil to the burner by filtering out harmful dirt, sediment, abrasives, water and other foreign matter. Scientifically engineered and constructed entirely of metal. Will give years of service. Thousands now in use. Listed by UNDERWRITERS LAB., INC.,

FULLY GUARANTEED.

**INSTALL ONE YOURSELF
IN ABOUT 5 MINUTES**

No Special Tools Required
Complete Instructions Enclosed
SEND NO MONEY

Order now at the SPECIAL PRICE of \$2.95. Pay postman on delivery plus postage or enclose Check or Money Order and we ship POSTPAID.

CENTRAL COMPOUNDING CO., Distributors
2000 ST. PAUL AVENUE • DEPT. S3 • CHICAGO 47, ILL.

HANDY SANDER

WITH 2
EXTRA
REFILLS



A high-grade refillable tool for every sanding purpose. Made of steel, CADMIUM plated, furnished with abrasive cloth, cushioned with sponge rubber.

PRICE—\$1.00 COMPLETE WITH 2 EXTRA ABRASIVE CLOTH REFILLS!

TOOLCRAFT CORPORATION

3235 W. Chicago Ave.

CHICAGO 51, ILL.

HIGH POWERED TELESCOPE

60 POWER—5 SECTIONS—only \$4.50

HARDENED ALUMINUM TUBES—LENGTH OPEN 33", CLOSED 11", WT. 8 OZ. VARIABLE POWER EYEPIECE 15X-30X-60X

NEW! 3 different magnifications by simple adjustment of the eyepiece. 15 power for ultra-bright images with 30 and 60 power for extra long range. Guaranteed to bring distant objects, people, sports events, ships, moon, stars, etc., 60 times as close. Most powerful for anywhere near the money.



Leather
Case Included

All 5 tubes are made of strong but light-weight aluminum. 4 precision ground and polished optical glass lenses. When collapsed it is used as a powerful compound microscope adjustable to 3 different magnifications. Directions included. Money back guarantee. Complete and ready for use, with genuine leather carrying case, at the amazingly low price of only \$4.50. We pay the postage. Immediate delivery.



As a Microscope

BROWNSCOPE CO. Dept. 3P, 24 West 45th St.
New York 19, N. Y.

290 POPULAR SCIENCE



Aids to



Hanger Adds to Closet Space.

Storage room for children's clothes is doubled with this hanger sold by Nursery Plastics, New York City. The rod is cellulose acetate over a hardwood dowel with the vertical pieces in a contrasting color.



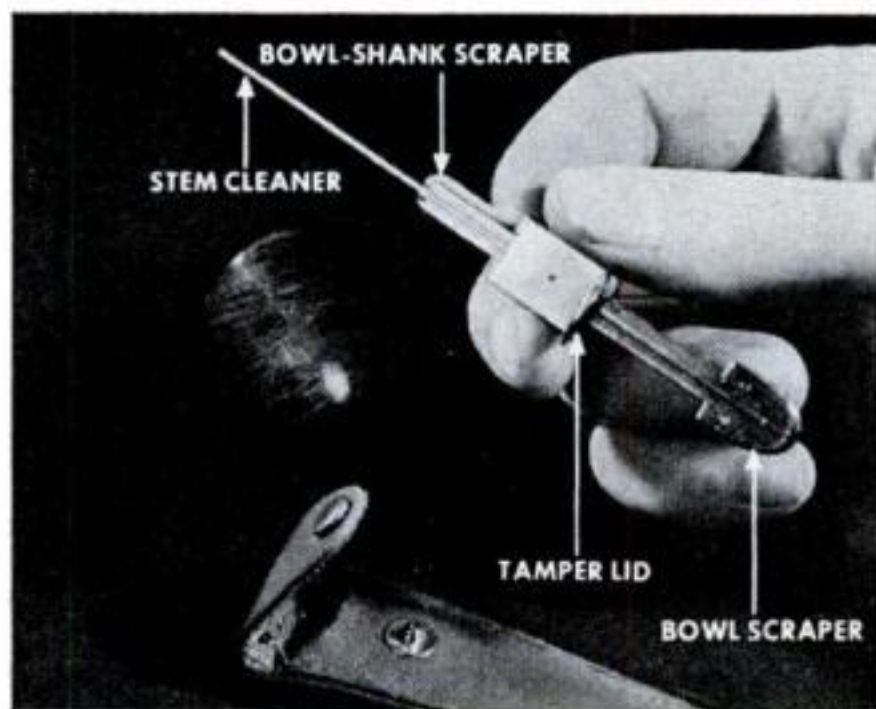
Mattress Keeps You Warm.

An electrical heating unit maintains this mattress at a comfortable temperature, according to the Sylcon Corporation. The heat is concentrated in the area of the feet and legs. The price is \$60 and up.

Modern Living



Rack Up Your Ironing. Two chrome-plated rods, connected at right angles, are clamped to any standard ironing board to support up to 12 pieces of clothing. Rods are disconnected for storage. Hufeld Engineering Co., Peoria, Ill., is the maker.



Gadget Cleans Pipes. The spade-shaped end reams out the bowl and the other end is used to clean the stem. At the end of the forefinger in the photo is a section that reams out the shank. The maker is Fred Wacker Co., Long Island City, N. Y.

**NOW ANYONE
CAN PUTTY WINDOWS**

with the

DUO-FAST PUTTY KNIFE

NEW EASY FAST



Does a perfect job. Packs—Shapes—Trims putty. Makes a hard job easy. Pays for itself on first window. Get yours, today! It will be your favorite tool!

See

\$1.00

Your Hardware, Paint, Glass or Lumber Dealer—OR Order Direct.

ONLY \$1.00 POSTPAID IN U.S.A.

Duo-Fast PUTTY KNIFE FASTENER CORP.
876 Fletcher Street, Chicago 14, Illinois

I am enclosing \$1.00 — please send me one Duo-Fast PUTTY KNIFE

NAME _____

ADDRESS _____

CITY _____ STATE _____

Real Private Telephone

WITH ACTUAL SIZE TELEPHONE HANDSETS

Indoor or Outdoor

Nothing to Change, Add, or Buy

Just push buzzer to call. No electrical connections. Comes complete and includes: 2 French type handsets, 2 push button boxes with buzzers, 1 50 ft. roll of wire.

Necessary battery also included. These sets come already wired and ready for use. No instructions necessary. Guaranteed to please or your money refunded. Additional wire, if needed, may be purchased for 3¢ per foot.



COMPLETE 2 PHONES .. \$14.95

MOUNT THESE PHONES ANYWHERE YOU LIKE. All that's needed are 2 screws or 2 nails for each box. These are the two telephone boxes with buzzers. Can be mounted on side of desk. Can be mounted on wall. Noise free in noisy areas. No electrical connections. No squeals. No tubes. No hum.

Send Check or Money Order to

TALLEN-FONE

562 Atlantic Ave., Brooklyn 17, N. Y.
Tel. TRIangle 5-8241

SAVE FOOD-TIME ELECTRICITY

Amazing Invention

DEFROSTS Any Refrigerator

AUTOMATICALLY Every Night

JUST PLUG IN—No Installation Costs

\$9.95

In less than a minute DE-FROST-IT converts your present refrigerator—regardless of model or age—to fully AUTOMATIC defrosting. Works every night while you sleep. Ends drudgery, fuss and muss of frequent cleaning. Refrigerator works better—runs less. Checks odors. Keeps food fresh longer. Hang DE-FROST-IT on wall and plug in. (110 volts AC only) PAYS FOR ITSELF IN SAVING.

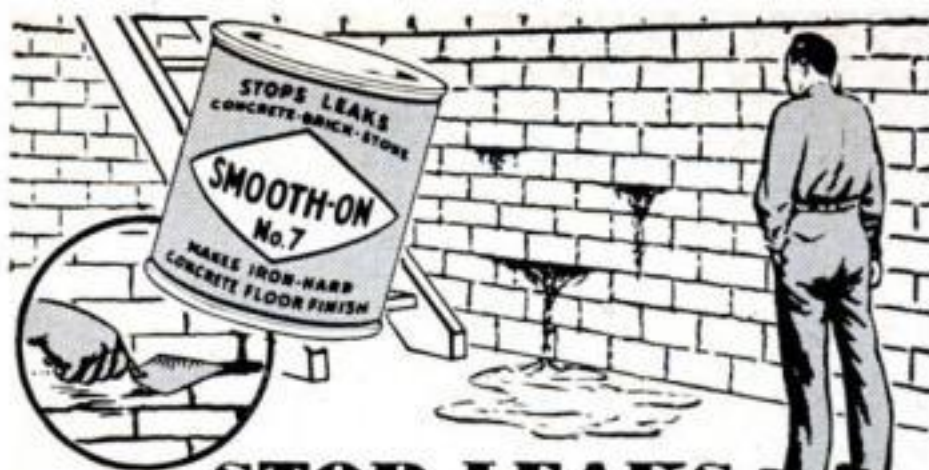
Postpaid if you send Chk. or M.O. COD 25% with order. Pay postman balance and postage.

TEST AT OUR RISK

Money back in 5 days if not fully satisfied.

KALE CRAFT SUPPLIES, 2250 Milwaukee Ave., Chicago 47, Ill.

MARCH 1949 291



STOP LEAKS IN CELLAR WALLS

Do it with Smooth-On No. 7 Cement! Apply with trowel or stiff brush to leaky cracks, holes, porous spots, seams or other leaks in concrete, brick or stone walls and floors. The leaking will stop and Smooth-On will "stay put", for it expands slightly as it hardens. May be applied to wet or dry surfaces, indoors or outside. Use Smooth-On No. 7, too, to seal openings around pipes passing through walls. Buy Smooth-On No. 7 by name and number in 1-, 5-, 20- or 100-lb. size. If your hardware store hasn't it, write us.

FREE Leaflet and Handbook

We'll send you leaflet showing No. 7 uses, also the famous 40-page Smooth-On Repair Handbook describing other Smooth-On Cements and showing many helpful home repairs. 170 illustrations. Write today.



SMOOTH-ON MFG. CO., Dept. 58C
570 Communipaw Ave., Jersey City 4, N. J.

Do it with
SMOOTH-ON
NO. 7 CEMENT

SAVES FUEL! Thermostatic RADIATOR VALVE...

Automatically
LETS YOU HEAT ANY
ROOM INDIVIDU-
ALLY AT THE MOST
COMFORTABLE TEMPERATURE.

Replaces ordinary air valves. Radiator heats only when temperature drops below valve setting and shuts off vent when setting is again reached. May be installed in one-pipe steam system.

See Your Local Dealer or Write HEAT-TIMER CORP., 160 Fifth Ave., N. Y. C.



\$4.95

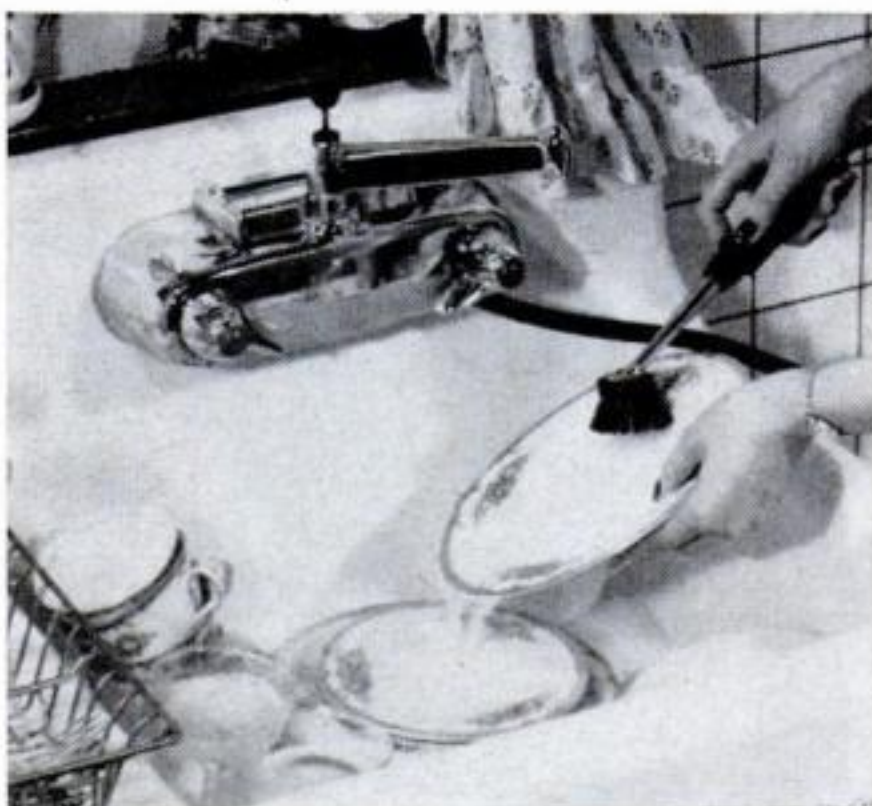
prepaid



A must tool for electricians, maintenance men, home owners. Replaceable lamp inside Plier tests 110 to 250 Volts. Plier pulls fuses from 10 to 100 Amperes. Shockproof. Requires the use of only one hand. Can be obtained from General Electric or Westinghouse stores, local electric dealers or direct from us, postpaid.

Price \$2.75 without Leads, \$1.50 additional for Leads. Order TODAY.
STAR FUSE CO., 237 Canal St., New York 13, N. Y.

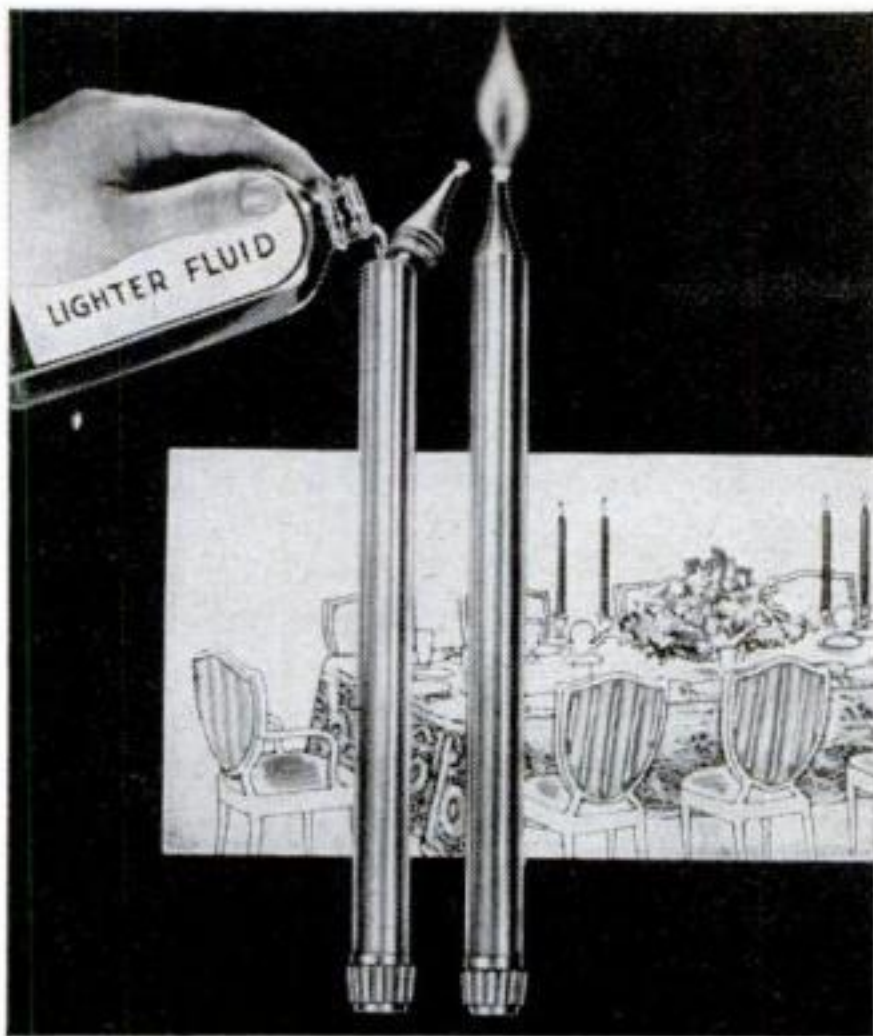
Aids to Modern Living



Speeds Dish Washing. Installed in place of the regular faucet assembly, the Dishmaster® mixes air, water, and detergent and then passes it through the spray handle that has a circular brush tip. Pressing and releasing a control button on the handle gives either suds or rinse water. The housing, handles, and brush rest are zinc die castings. Distributor is the Gerity-Michigan Corp., Adrian, Mich.



Spinning Disk Dumps Ashes. Finger pressure on the plunger drops the central disk in this ashtray and starts it whirling. Centrifugal force throws cigarette stubs and ashes into the container where smoke and tobacco odors are sealed in when the disk comes up. The distributor, Rexon, Inc., of New York City, markets the ashtray for about \$6 to \$8, depending on the finish of bronze or chrome.



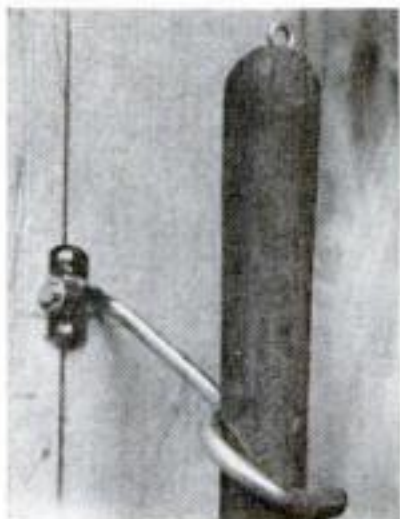
Candles Burn Lighter Fluid.

Made of aluminum alloy, Anaware Ever-lasting Candles® offer decorative charm without the usual dripping wax. The hollow center, filled with lighter fluid, contains four hours' fuel. Priced about \$4 a pair by H. G. Erstrom Engineers, Chicago.

Your Photo on Playing Cards.

Robinson-Sherman Playing Cards, of New York City, offer decks of cards with either your photo or a caricature of yourself as decorations on the backs. The caricature cards show you at your hobby or favorite sport. If you're a golfer, for example, they'll picture you dubbing a tee shot. The photo cards are priced at \$8.60 for two decks; the caricature cards at \$11.60 for two.

Hook Hangs Up Tools. Garden implements, mops, carpet sweepers, and brooms are racked up by the Hang-It® wall hook, manufactured by Gardex Inc., of Michigan City, Ind. A groove and stop holds the hook away from the wall so tools may be inserted or removed with one hand. The hook, priced at 10 cents, is steel that has been plated against rust. It holds metal or wooden handles.



20 DIFFERENT BLADES



NO. 75 **X-acto** COMPLETE CARVING SET

Here's everything you need for a super-slick job, from toothpicks to totem poles. Super-sharp blades, firm-grip handles for light and heavy work. Ideal for wood, linoleum, plastics, etc. Contains: 6 different gouges, 4 routers, 2 punches, 6 regular blades, 2 three-inch blades, one No. 1 knife, one No. 5 knife. On wooden block, complete.....Only \$5.00

*Reg. U. S. Pat. Off.

Other X-acto Knives, Blades, Tools and Sets, 50¢ to \$50
Prices slightly higher in Canada

At hobby, gift, hardware and department stores

X-acto Crescent Prod. Co., Inc., 440—4th Ave., N. Y. 16
In Canada: Handicraft Tools, Ltd., Hermant Bldg., Toronto

Get This
Now!



SPRAY PAINTING

New Book Makes Money
Saves Money

Complete Instruction for Professional
Use and 'Round-the-House Jobs—
Includes Auto Painting and Refinishing

Get this new 1948 spray painting book to help you on the job or for better and time-saving paint work around the home and car. Thoroughly practical—covers every phase of spray painting technique. Tells what paint or other finish to use, how to mix colors, how to make perfect jobs, easy, quick.

New edition has over 160 pages. Cloth binding. Illustrated. Send \$2.00 for postpaid delivery or we will send C.O.D. Money back if not satisfied.

FREDERICK J. DRAKE & CO.

117 Green Bay Road

Dept. 53

Wilmette, Ill.

**NOW IT'S EASY
TO REMOVE PAINT**



Remove paint, varnish, enamel, lacquer, or shellac—without burning, without hard scraping! Wonder-paste does the trick quickly, easily. That's why painters have been using it for years.

Simply apply Wonder-Paste directly over the old finish with a paint brush. Allow time for complete penetration—then slide off the soft, sludgy mass with a putty knife. Leaves no raised grain or scorched areas to be sanded. Write for Wonder-Paste Leaflet and ask for advice on your particular removing problem. Get Wonder-Paste from your paint or hardware store.

WONDER-PASTE

Wilson-Imperial Company, 121 Chestnut Street, Newark 5, N. J.

TO:

Reader

FROM:

Editor

Crossing Our s

YOU may have wondered about the little Ts sprinkled through the editorial pages of POPULAR SCIENCE. Although they are identified on the contents page in every issue, a fuller explanation seems to be in order.

Many publications avoid trade names in their text as they avoid obscenity. Many magazines would paint out the name plate of an automobile in a photograph—as if that fooled anybody who knew his Pierce Arrows! Some newspapers still go to ludicrous lengths to avoid mentioning the name of a magazine. You may have noticed rather important pronouncements freely quoted from an article in “a weekly magazine.” When what the General said in the *Saturday Evening Post* was common talk.

The tradition that commercial names should not profane the editorial columns had reasonable roots. As custodians of reader interest, editors have always had to resist the persuasions of persons and properties who would like their importance amplified and their shortcomings concealed. So editors have leaned over backward—an uncomfortable stance in which to fight real encroachment effectively. But, as magazines and newspapers have—with their readers—acquired a more adult attitude, such postures of knightly purity seem as antiquated as iron shirts.

Nowadays, you can read in *Time* that President Wilson of General Motors “chain-smokes Chesterfields.” Or in *Outdoor Life* that the hunter cuddled his Winchester to his cheek and lined up the cross hairs of the Lyman sight on the shoulder of the mountain goat. Even in fiction, the hero meets the girl in a Greyhound bus—and the girl smells interestingly of Chanel No. 5.


This naming names is old stuff in POPULAR SCIENCE, which aims at being useful. In this magazine, names are facts as pertinent as dimensions. Our writers don’t mumble vaguely about wire used in a heating coil as “a special alloy.” We call it Nichrome®, and that’s what you ask for at the hardware store.

We had our troubles trying to be truly useful and factual. Not even our experts know everything, and sometimes they would

fail to put a trade-marked name in capitals or quotes. What was worse, the eagle-eyed beagles in our copy room (where ostensible facts are scrutinized suspiciously) have found no quick way to tell the trade-marks from the trade names.

There is a legal difference: a trade-mark is registered at the U. S. Patent Office. It is a valuable piece of property privately owned by the company using it and registering it. Technically, a trade-mark must be so identified every time it is used—on the label and package, in an advertisement or editorial article—by capital letters, or a footnote, or the letter R in a circle. Like the letter C in a circle that denotes copyrighted material.

But too many companies are careless about identifying trade-marks. And a lot of names used in the trade are not, or cannot, be registered. To be of practical service to readers, we have defined all commercial names as “trade names,” whether registered as trade-marks or not. We start them off with a capital letter, which covers the technicalities, and a few issues ago we began identifying them with a letter T in a circle.

Soon, we got a friendly letter from the Trumbull people in Connecticut telling us that the plain capital T in a circle was *their* trade-mark for their electrical products. So we substituted, as soon as we could, a different T. Finally the printers came through with a lower-case t in an oval, which we hope will keep everybody happy. Since POPULAR SCIENCE goes to press in three different pieces at different times and places, it may take a little time to standardize on the new mark  throughout the magazine.

I hope this answers the questions raised by readers and manufacturers. And that both appreciate the practical values of knowing the name of a product or material by which it is known in the trade, in the stores and factories, and in the workshops and living rooms of America.



Perry Githens

This One



6J43-NC0-5ERY

now screening
that will

NEVER RUST

at an amazing low price!



**CAN'T
CORRODE**

**AMAZINGLY
STRONGER**

**CAN'T STAIN
THE HOUSE**

Facts for Architects and Builders

Effects of Acids, Alkalies and Solvents—Essentially none.

Non-inflammable — Will not support flame.

Melts at—340°F.

Tensile Strength, Ultimate (of filament)
—Up to 50,000 lbs. per square inch.

Impact Strength—Greater than conventional screening.

Installation — Cut with ordinary scissors. Fold cut edges under one-half inch. Tack every 1½ inches through two thicknesses. . . . Being elastic, Lumite will automatically draw itself into a snug, firm fit.

It's true. You can now get rustproof screening and save money, too! LUMITE, the new miracle plastic, actually costs only 11½-12¢ per square foot—much less than any other quality screening.

And LUMITE lasts longer because it never rusts or corrodes. It never stains paint under windows . . . never needs painting to prevent rust in any climate, anywhere.

Order LUMITE from your hardware, lumber or building supply dealer. Write for free sample to Dept. PS-1, LUMITE DIVISION, Chicopee Manufacturing Corp., 47 Worth Street, New York 13, N. Y.

Insist On Rustproof Screening

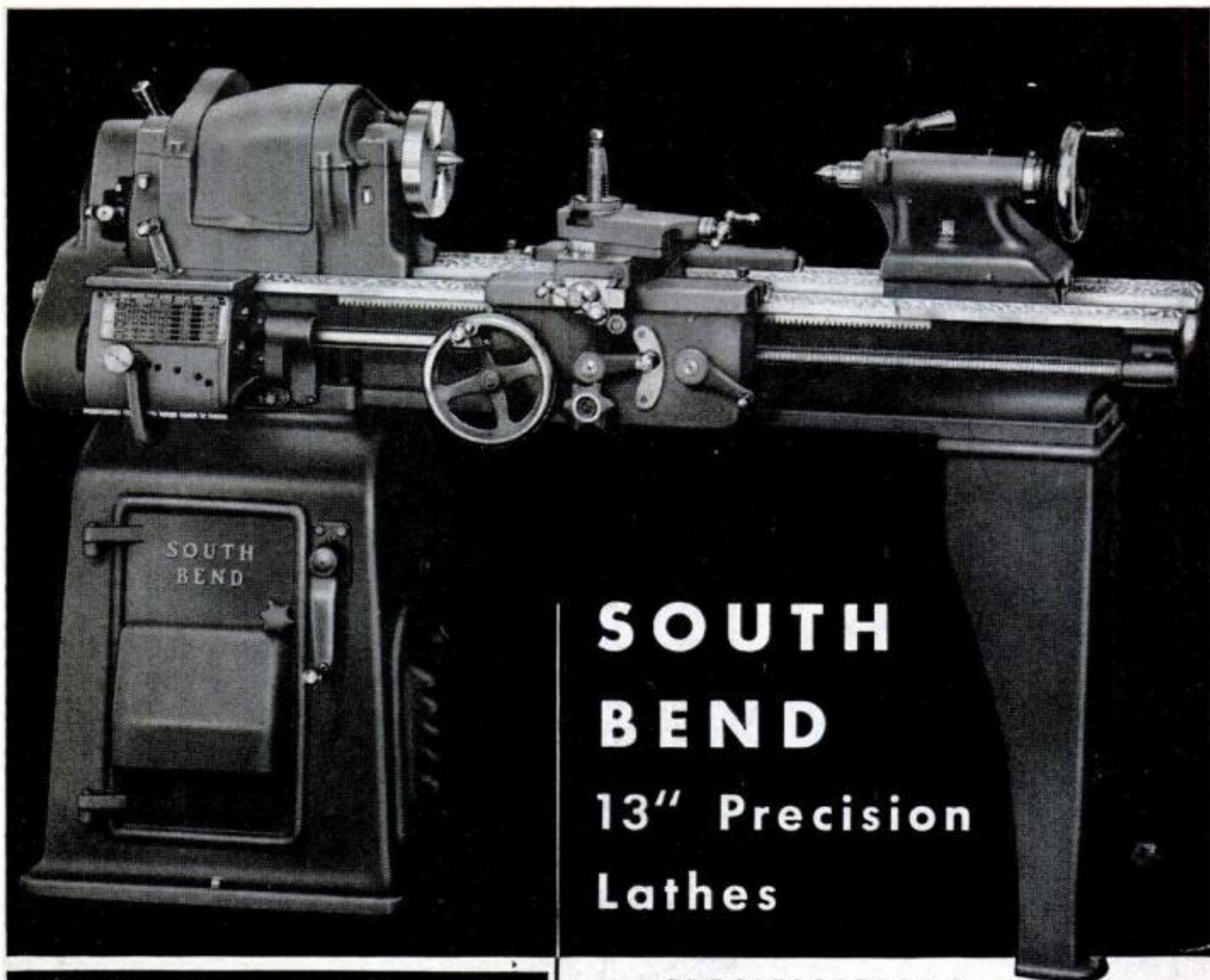
LUMITE*

Woven of saran



®

MARCH 1949 295



SOUTH BEND 13" Precision Lathes

NOW - 1" Collet Capacity

Catalog No. 145-B 13" x 5' Quick Change Gear Lathe with 3 phase, 60 cycle, 220 volt, A.C. motor and drum switch; f. o. b. factory **\$1332.25**

South Bend 13" Precision Lathes now offer even more advantages where close-tolerance machining is required. They are economical, accurate, fast, and versatile. The new headstock with increased collet capacity permits a greater variety of collet jobs. Substantial savings in capital investment, floor space, and labor cost often result from their installation.

The Quick Change Gear model is popular for production operations, maintenance and service work. The Toolroom model has sufficient capacity for a large variety of toolroom work—its accuracy insures perfect results. Numerous tools and attachments are available for special jobs. Other South Bend Precision Lathes are made with 9", 10", 14½", 16", and 16/24" swings. Also Precision Turret Lathes with ½" and 1" collet capacities, a 14" Drill Press in bench and floor models, and a 7" Bench Shaper. Immediate deliveries can be made. Time Payment Plan is available.

SPECIFICATIONS

SWINGS: 13-1/8" over bed and saddle wings; 8-3/4" over saddle with chip guard removed.
BED LENGTHS 4, 5, 6, and 7 feet
DISTANCE BETWEEN CENTERS 16 to 52 inches
MAXIMUM COLLET CAPACITY: 1" (Collets interchangeable with South Bend 10"-1" collet, Series 1000, 14½", 16", 16/24" Lathes)
SPINDLE BORE 1-3/8 inch
SPINDLE SPEEDS: Eight 34 to 875 r.p.m.
POWER LONGITUDINAL FEEDS: 48 R.H. or L.H., .0015" to .0841"
POWER CROSS FEEDS: 480006" to .0312"
THREAD CUTTING: 48 R.H. or L.H. pitches . . 4 to 224 per inch
CROSS SLIDE TRAVEL 8-1/8 inches
TAILSTOCK TOP SET-OVER 15/16"

Write FOR THIS CATALOG NO. 73

Describes and illustrates new South Bend 13" Precision Lathes with 1" maximum collet capacity. Includes complete specifications and prices.



SOUTH BEND LATHE WORKS

Building Better Tools Since 1906 • 456 E. MADISON ST., SOUTH BEND 22, INDIANA

I Send You BIG KITS of RADIO PARTS

YOU PRACTICE Radio Soldering with Soldering Equipment and Radio Parts I send you. Get practical experience mounting and connecting parts.



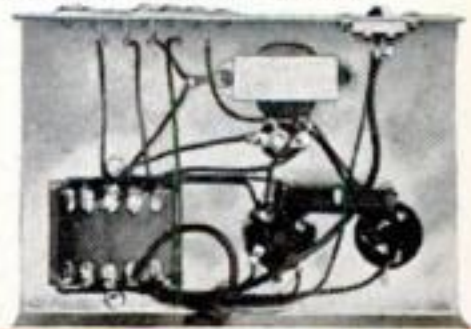
YOU BUILD this Tester with parts N. R. I. sends early in course. Soon helps you fix neighbors' Radios and EARN EXTRA MONEY in spare time.



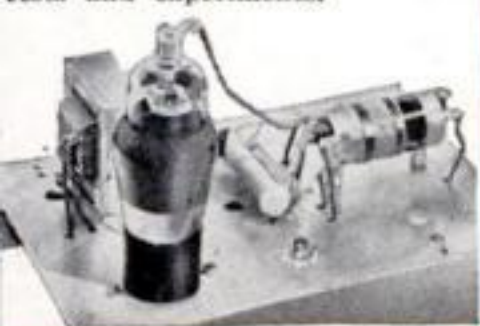
YOU TEST Radio Circuits like this built with parts I send. Build special circuits; learn how to locate and repair circuit defects.



YOU BUILD Vacuum Tube Power Pack; make changes which give you experience with packs of many kinds. Learn how to correct Power Pack troubles.



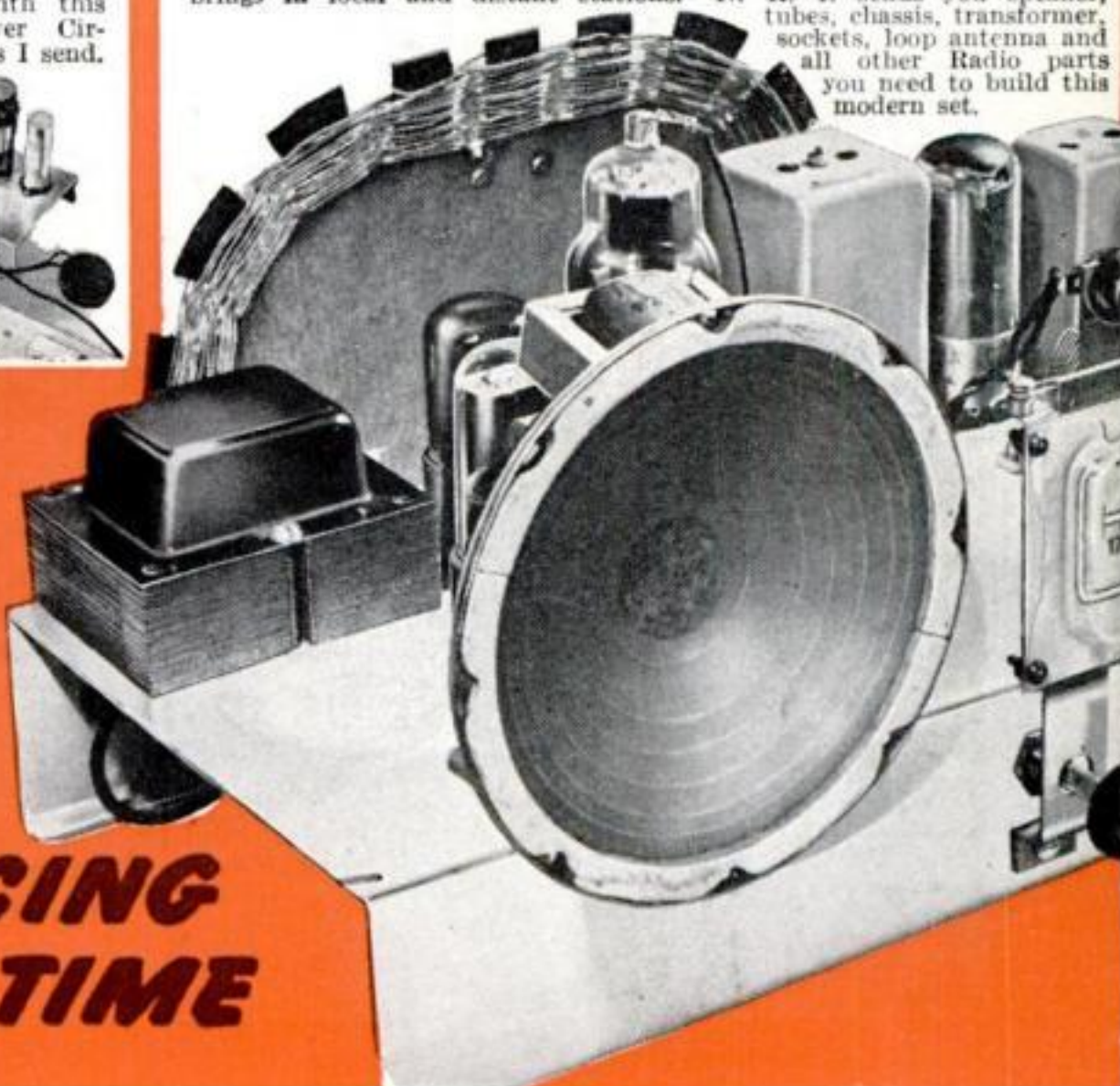
YOU BUILD this A. M. Signal Generator for more valuable experience. It provides amplitude-modulated signals for many tests and experiments.



YOU PRACTICE FM (Frequency Modulation) experiments, get more experience with this Superheterodyne Receiver Circuit you build with parts I send.



YOU GET PRACTICAL EXPERIENCE. As part of your training, you build this powerful Superheterodyne Radio Receiver. It brings in local and distant stations. N. R. I. sends you speaker, tubes, chassis, transformer, sockets, loop antenna and all other Radio parts you need to build this modern set.



LEARN RADIO

BY PRACTICING IN SPARE TIME



J. E. SMITH, President
National Radio Institute

Want a good-pay job in the fast-growing Radio and Television Industries? Want to be boss of your own money-making Radio shop? Now is your opportunity! I've trained hundreds of men to be Radio technicians, *men with no previous experience* . . . and I can do the same for you. My unique train-at-home method gives you practical experience with **BIG KITS OF PARTS** I send. All equipment yours to keep. You also learn Radio and Television principles from step-by-step, easy-to-grasp illustrated lessons.

Make EXTRA MONEY In Spare Time

The day you enroll, I send you **EXTRA MONEY** booklets. Use your *know-how* to make **EXTRA MONEY** fixing neighbors' Radios in spare time.

From here, it's a short step to your own Radio shop or a good-pay Radio job.

N. R. I. Trained Men Face Bright Future

Think of money-making opportunities in Police, Aviation, Marine Radio, Broadcasting, Radio Manufacturing, Radio Repairing, Public Address Work, etc. And think of even greater opportunities in fast-growing Television, FM and Electronics.

Get Actual Lesson and Book Free

Act NOW! Mail post card for my special **DOUBLE FREE OFFER**. Get actual lesson, "GETTING ACQUAINTED WITH RECEIVER SERVICING," absolutely free. Discloses short-cuts used by Radio repairmen to check and repair Radios. Over 100 pictures and diagrams! Send now and also get my 64-page book, "HOW TO BE A SUCCESS IN RADIO-TELEVISION-ELECTRONICS." See how quickly, easy you can get started. But send NOW! J. E. SMITH, President, Dept. 9CP3, National Radio Institute, Pioneer Home Study Radio School, Washington 9, D. C.

**I WILL
TRAIN YOU
AT HOME**

**MY COURSE
INCLUDES
TELEVISION
ELECTRONICS**

GET 64 PAGE BOOK AND ACTUAL LESSON BOTH FREE! MAIL NOW!

Prove **CAMEL MILDNESS** *for Yourself!*



In a recent 30-day test of
hundreds of Camel smokers,
noted throat specialists reported
**NOT ONE SINGLE CASE OF
THROAT IRRITATION**
due to smoking **CAMELS!**

*According
to a Nationwide
survey:*

**MORE
DOCTORS
SMOKE
CAMELS
than any other
cigarette**

Doctors smoke for
pleasure, too! And
when three leading
independent research
organizations asked
113,597 doctors what
cigarette they
smoked, the brand
named most was
Camel!



● How mild can a cigarette be? Make the 30-day
Camel mildness test—and then you'll *know!*

A similar test was recently made by hundreds
of smokers. These men and women smoked
Camels, and only Camels, for 30 days. Each week,
noted throat specialists examined the throats of
these smokers. And these specialists reported *not
one single case of throat irritation due to smok-
ing Camels!*

Put Camels to the test yourself—in your
“T-Zone.” T for Taste—T for Throat.

Money-Back Guarantee!

Try Camels and test them
as you smoke them. If, at
any time, you are not con-
vinced that Camels are the
mildest cigarette you ever
smoked, return the package
with the unused Camels and
we will refund its full pur-
chase price, plus postage.
(Signed) R.J. Reynolds Tob.
Co., Winston-Salem, N. C.